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BUREAU OF HYGIENE AND TROPICAL DISEASES.

TROPICAL DISEASES BULLETIN.

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LEPROSY.

MACLEOD (J. M. H.). **Leprosy in Great Britain at the Present Time.**—*Leprosy Review.* 1938. Jan. Vol. 9. No. 1. pp. 5–12.

The number of cases in Great Britain is unknown, but is estimated to be between 75 and 100. The author has previously recorded three infections of children from relatives in this country, but the great majority are adults returning to Great Britain from tropical countries, who are not a material source of danger, as they come little into contact with the susceptible children. Twelve cases are isolated at the St. Giles' home in a remote part of Essex. Interesting historical data are included in this Chadwick lecture. *L. Rogers.*

McCOY (George W.). **History of Leprosy in the United States.**—*Amer. Jl. Trop. Med.* 1938. Jan. Vol. 18. No. 1. pp. 19–34.

This is the report of the Craig Lecture of the American Society of Tropical Medicine which deals with this oft-discussed subject. McCoy thinks it probable, but not certain, that leprosy was introduced to the Western Hemisphere after its discovery, probably from Europe, Asia and Africa. He points out once more that the disease spread materially in the Southern States, very slightly in the Western ones, but the Scandinavian-introduced disease in the northern central States tended to die out. This he cannot account for, as he is not in agreement with the view that climatic conditions will explain the facts. He approves of control by the colony method, but holds that there is "no convincing evidence that any control measures yet attempted have been successful in materially retarding the spread and prevalence of this disease." *L. R.*

LE BIHAN. Note sur la lèpre dans le département du M'Bomou (Afrique équatoriale française). [**Leprosy in French Equatorial Africa.**]—*Ann. de Méd. et de Pharm. Colon.* 1937. July–Aug.–Sept. Vol. 35. No. 3. pp. 988–997.

This note deals with epidemiology and treatment.

Inquiries regarding 1,832 cases of leprosy showed direct family antecedents in 1,182. Goitre is very prevalent in the area dealt with, but does not appear to predispose to leprosy. Elephantiasis, however, does, for 70 per cent. of operation cases were complicated by leprosy

and the two diseases are very prevalent in the same areas. Methylene blue had a good effect on pains and the general condition when combined with chaulmoogra treatment. Capsules of hydnocarpus oil orally gave better results than methylene blue alone. An indigenous treatment by violent purgatives and emetics appeared to do some good in spite of their debilitating effects. *L. R.*

URUEÑA (Jesús González). **The Leprosy Census in Mexico up to 1936.**—*Internat. Jl. Leprosy.* Manila. 1938. Jan.–Mar. Vol. 6. No. 1. pp. 47–50. With 1 fig.

In 1930 a census of leprosy cases was taken in Mexico by means of an inquiry from physicians and others, and in 1935 this was repeated. The latter revealed 3,882 cases, 53·3 per cent. of whom were males. The more serious nodular cases formed 30·1 per cent. Only 13·3 per cent. were isolated in wards, 12 per cent. "properly at home" and 74·7 per cent. "improperly at home." Prohibited trades were being practised by 27·8 per cent. The social and housing conditions of the patients were bad in 74 to 86 per cent., and overcrowding was noted in 47·7 per cent. A total of 6,739 healthy persons, including 2,717 children, were found living in the same rooms as the leprosy cases. Medical examinations made on 15,424 contacts resulted in the discovery of 98 cases who would ordinarily have escaped observation.

L. R.

AUSTIN (C. J.). **Leper Hospital, Makogai.**—*Leprosy Review.* 1938. Apr. Vol. 9. No. 2. pp. 77–82.

This is a review of twenty-five years' work of this leper institution. The small island of Makogai was formed into a leper settlement by the Fiji Government in 1911, and the inmates increased from 145 in 1912 to 300 in 1917. From 1927, cases were also admitted from other Australasian British possessions to reach a maximum of 575 in 1935. The total admissions in 25 years total over 2,000, mostly Indians, a number of whom were repatriated. In 1918 the conditional discharge after two years' freedom from active symptoms was legalized, and 365 have so benefited, of whom 62 were re-admitted, mostly for trophic lesions due to old nerve damage, so not true relapses. The disease is more severe and less amenable to treatment in Fijians than in Indians, the former showing improvement in 45·8 per cent. against 67·6 per cent. in the Indians. *L. R.*

KLINGMÜLLER (Victor). Lepra. Uebersicht seit 1930. [**Leprosy. Review of the Disease since 1930.**]—Reprinted from *Zent. f. Haut- u. Geschlechtskr. s. d. Grenzgebiete.* Vol. 57. No. 5/6. pp. 321–424. [Numerous refs.]

MUIR (Ernest). **The Epidemiology and Control of Leprosy.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1938. Jan. 25. Vol. 31. No. 4. pp. 377–382.

In this short paper the author states his well known-views. Compulsion has its place when applied by the community itself, and not from without. Treatment by general methods to improve the health, combined with chaulmoogra remedies, also has an important part to play. *L. R.*

BABLET (J.). La lèpre, problème scientifique, problème social. [**Leprosy Problem.**]—*Rev. d'Hyg. et de Méd. Préventive.* 1938. Feb. Vol. 60. No. 2. pp. 81–98. [80 refs.]

This is a general discussion on prophylaxis that contains little new. The author stresses the necessity of protecting children from infection, and he supports the propaganda and dispensary treatment plan adopted in India by MUIR. References to a number of recent papers are given. *L. R.*

HENDERSON (G.). The Problem of Leprosy.—*Med. Bull.* Bombay. 1938. Feb. 5. Vol. 6. No. 3. pp. 88–90.

HUIZENGA (Lee S.). Leprosy Problem in Matang Hsiang, Jukao Hsien, Kiangsu.—*Chinese Med. Jl.* 1938. Mar. Vol. 53. No. 3. pp. 287–289. With 1 map.

WADE (H. W.), COCHRANE (R. G.) & RAJ (M. Paul). **The Skin Lesions of Neural Leprosy. IV. Observations in Madras, South India.**—*Internat. Jl. Leprosy.* Manila. 1937. Oct.–Dec. Vol. 5. No. 4. pp. 437–462. With 36 figs. on 6 plates.

This is the fourth paper on this subject based on observations in South India on 42 neural cases in the Willingdon Settlement. They class 7 as major tuberculoid, 6 as minor tuberculoid or intermediate, 5 as retrogressive papulate and the remaining 24 as simple. The last two forms preponderate to a greater extent than among Philippine or Chinese cases, but on the whole the clinical features do not differ much from those of the previous groups. *L. R.*

VIEIRA (João Paulo) & DE ABREU (Manoel). Contribuição ao estudo das modificações papillares na lepra. [**Changes in the Digital Papillae in Leprosy.**]—*Rev. Brasileira Leprologia.* S. Paulo. 1938. Mar. Vol. 6. No. 1. pp. 15–20. With 10 figs. on 5 plates. English summary.

The authors have studied the finger-prints of 216 lepers at the St. Angelo leper colony, São Paulo, and have found definite changes in more than one-third. The neural forms showed them most, in 12 per cent., the macular and the mixed in 9, the nodular in 6 per cent. only. It was found to begin, or to be earliest evident, in the little and ring fingers [ulnar distribution ?] and then spread to the others, but is never sufficiently early to be of diagnostic value in this disease. The prints are well reproduced, though rather small, and a photomicrograph illustrates well the epithelial atrophy of the little finger of a leper and the normal condition of that of the thumb. *H. H. S.*

HUGHES (William). **Tuberculoid Leprosy.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1938. Jan. 25. Vol. 31. No. 4. pp. 383–399. With 10 figs. on 4 plates & 1 diagram. [24 refs.]

This is a lengthy clinical and histological study of cases in Malaya. The author thinks recent work on tuberculoid leprosy to be of great importance. His histological results agree so closely with those of WADE as not to require detailed description. The plaques and the borders of the annular lesions show similar changes. Bacilli are usually

few, but may occasionally be numerous during reactions. Good photographs of the lesions in different phases are reproduced. As MUIR pointed out, lesions may disappear during recurrent diseases such as typhoid, and reappear later during convalescence. He found a low incidence of tuberculoid forms in Malays, a high incidence of the milder neural cases in Chinese and in Tamil southern Indians, but low rates in children with more active disease. He regards the tuberculoid form as a stage in the natural evolution of immunity in the disease, so it is common in races which have for long been associated with leprosy. *L. R.*

TISSEUIL (J.). Lésions lépreuses tuberculoides disparaissant au fur et à mesure de l'envahissement des éléments cutanés encore sains. [**Tuberculoid Leprosy.**]—*Bull. Soc. Path. Exot.* 1937. Dec. 8. Vol. 30. No. 10. pp. 845–847.

In this brief note the author describes the spread of annular tuberculoid lesions at the margin while the centres heal, but leave behind profoundly modified tissues with loss of the papillae and other structures. *L. R.*

RABELLO, Jr. Données nouvelles pour l'interprétation de l'affection de Besnier-Boeck : Rôle de la lèpre. [**Besnier-Boeck Affection and Leprosy.**]—*Internat. Jl. Leprosy.* Manila. 1937. Oct.–Dec. Vol. 5. No. 4. pp. 483–498. [35 refs.] [Reprinted from *Ann. Dermat. et Syph.* 1936. Vol. 7. pp. 571–597.

REENSTIERNA (John). **The Possible Rôle of Leprosy in the Etiology of the Besnier-Boeck Sarcoid and Schaumann's Syndrome.**—*Internat. Jl. Leprosy.* Manila. 1937. Oct.–Dec. Vol. 5. No. 4. pp. 433–436.

These papers discuss the clinical and pathological relationships of leprosy and the Besnier-Boeck Sarcoid and Schaumann's Syndrome.

Besnier first described lupus pernio, and Boeck multiple sarcoids of the skin from the dermatological point of view, and Schaumann the autonomous syndrome lymphogranulomatosis benigna to include the former, and also its erythrodermic manifestations. Rabello now argues that the tuberculoid form of leprosy presents similar clinical and pathological changes to the conditions just mentioned, especially as seen in South America, including changes in the reticulo-endothelial, gland and bone marrow tissues.

On the other hand Reenstierna disputes Rabello's position, and summarizes his conclusions as follows :—

" 1. Leprosy may manifest itself in the form of skin affections which histologically coincide with Besnier's lupus pernio, Boeck's cutaneous sarcoids and Schaumann's erythrodermia.

" 2. Leprosy is able to cause in the bones, and perhaps also in the lungs, changes which radiologically are strikingly like those that have been observed in connection with those skin affections.

" 3. It has not been shown or proved that the micro-organism of leprosy can cause the systemic reactions which together constitute Schaumann's syndrome.

" 4. In order to show that such might be the case it would be necessary to make specially directed postmortem examinations." *L. R.*

RAMIRO GALVEZ (A.). **Study of a Benign Form of Leprosy localised in the Feet.**—*Leprosy Review.* 1938. Apr. Vol. 9. No. 2. pp. 71–76. With 8 figs.

This is a short illustrated description of 14 cases of a chronic form of neural leprosy with lesions limited to the feet, including deformities of the toes and perforating ulcers. Chaulmoogra preparations much improved the nerve conditions, and in mixed cases produced healing and loss of the lepra bacilli. *L. R.*

BOUSEFIELD (C. E.). **The Ulcers of Leprosy.**—*Internat. Jl. Leprosy.* Manila. 1938. Jan.–Mar. Vol. 6. No. 1. pp. 73–74.

This paper describes a successful treatment for large ulcers of leprosy.

These cases are liable to be very resistant and not infrequently end in death from septic complications. The presence of an anaesthetic area is an important diagnostic feature, and lepra bacilli can often be demonstrated. Any necrosed bone must first be removed, and only mild antiseptic solutions and dressings applied because there is no sense of pain to warn against danger. General treatment includes intramuscular as well as intradermal local injections, in the anaesthetic areas, of iodized chaulmoogra esters, the latter not exceeding 0·5 cc. For local antiseptic treatment from 0·5 to 2 per cent. copper sulphate solutions have proved best for frequent washing and applications on dressings several times a day. Plentiful good food, including cod-liver oil, is also essential. By these means the former despair induced by large leprous ulcers has been replaced by an assurance that they can always be cured with the co-operation of the patient. *L. R.*

LOWE (John) & CHATTERJI (S. N.). Extensive Ulceration of the Skin in Leprosy.—*Leprosy in India.* 1938. Jan. Vol. 10. No. 1. pp. 7–9. With 3 figs. on 1 plate.

REISS (F.). Erythema Nodosum Leproticum.—*Chinese Med. Jl.* 1937. Sept. Vol. 52. No. 3. pp. 367–376. With 7 figs. on 3 plates. [15 refs.] Also in *Internat. Jl. Leprosy.* Manila. 1937. Oct.–Dec. Vol. 5. No. 4. pp. 427–432. With 7 figs. on 2 plates. [15 refs.]

DUSAN (J.) & BONNET (J.). Léprides érythémato-circinées poussée nouvelle chez une hansénienne régulièrement traitée. [**Exacerbation of Cutaneous Lesions of Leprosy in a Patient under General Treatment.**] —*Marseille-Méd.* 1937. Sept. 5–15. Vol. 74. No. 25–26. pp. 205–208.

YAMASAKI (Eisô). Ueber Pemphigus leprosus. [**Pemphigus leprosus.**]—*Japanese Jl. Dermat. & Urol.* 1937. Nov. 15. Vol. 42. Supp. to No. 4. pp. 269–273.

VALLE (Sergio). Prophylaxie de la cécité au cours de la lèpre. [**Blindness in Leprosy.**]—*Arch. d'Ophtalmologie.* 1937. Oct. N.S. Vol. 1. No. 10. pp. 865–880.

This paper records the experience of a Brazil eye specialist.

He finds that it is impossible to prevent insidious affections of the eye developing in the course of leprosy, often ending in blindness.

unfortunately chaulmoogra preparations are liable to provoke dangerous reactions in the eye, so they should be avoided on the occurrence of such complications. The anterior segment of the eye is the seat of leprous disease, and the author holds that the organ may be invaded from affections of the neighbouring parts, such as the eyebrows and eyelids. He therefore advocates cauterization, peritomy or iridectomy to prevent such invasions. Copper and gold salts may also be of value, and he also endorses the trypan blue treatment of Muir and Chatterji. *L. R.*

LOWE (J.). **A Note on the Classification of Cases of Leprosy.**—*Leprosy in India.* 1938. Jan. Vol. 10. No. 1. pp. 3–6.

The author makes some further suggestions on classification, although he indicates that the subject should be thrashed out at the Cairo Conference. He would now add to the various groups of letters he has already advised a — for negative bacteriologically and +, ++ or +++ to indicate the finding of a small, a moderate or a large number of bacilli in the lesions. *L. R.*

RYRIE (G. A.). **The Classification of Leprosy.**—*Leprosy Review.* 1938. Jan. Vol. 9. No. 1. pp. 20–24.

This author also criticizes the Manila classification, and suggests adding to that nomenclature indications of the resistance shown by the patients. Thus M represents minus-variants as regards resistance, and P plus-variants. Thus PC3 would represent an acute generalized attack of tuberculoid leprosy. The various modifications of the Manila classification will thus soon require the use of most of the letters of the alphabet. *L. R.*

KUSNETZOW (V. N.). **The Dynamic Classification of the Forms of Leprosy.**—*Internat. Jl. Leprosy.* Manila. 1937. Oct.–Dec. Vol. 5. No. 4. pp. 407–418.

This is a further criticism of the Manila Conference classification.

The author suggests that leprosy cases should be classified in accordance with the phase of the illness. He divides them into: (1) the first or latent period, which is the initial quiescent phase after infection; (2) The second, or florescent stage of progressive disease, subdivided into benign and malignant cases; (3) The third, or relatively stable stage in which a considerable degree of immunity has developed; and (4) the fourth, or healed period beyond the danger of relapse, which he regards as a rare occurrence. This division will serve as a guide to treatment with chaulmoogra preparations and gentle cauterization in the benign cases in the active phase, but sanatorium régime and general tonics in the malignant cases in which active treatment may do harm. *L. R.*

DA ROSA (A. Ferreira). Reação leprotica. [**The Lepra Reaction.**]—*Rev. Brasileira Leprologia.* S. Paulo. 1938. Mar. Vol. 6. No. 1. pp. 1–13.

A general review of the literature on the subject of the leprous reaction, of which the author mentions three types, cutaneous, neuritic and mixed. He agrees that it is an allergic (or parallergic)

reaction, and experimentally can be provoked by administration of iodide. The reaction he maintains is not of specific origin because Hansen's bacillus is not found in the reacting skin. *H. H. S.*

RADNA (R.). L'examen bactériologique dans le diagnostic de la lèpre. Notes comparatives entre la valeur de la méthode de recherche directe dans le sang et les autres méthodes usuelles. Première note. [**Bacteriological Diagnosis.**]—*Ann. Soc. Belge de Méd. Trop.* 1937. Dec. 31. Vol. 17. No. 4. pp. 555–563.

The results of different methods in 162 cases are reported.

The author found that in cutaneous and mixed cases the microscopical examination of the sediment of dehaemoglobinized blood taken from a vein, preferably during fever, gave good results with 84·31 per cent. positive. Incisions of lesions were positive in 76·36 per cent. and nasal mucus in 68·65 per cent. Among 7 nerve cases the blood test gave two positive and three slightly so. *L. R.*

LLERAS ACOSTA (Federico). **The Specificity of a Bacillus isolated from the Blood of Lepers.**—*Internat. Jl. Leprosy.* Manila. 1938. Jan.–Mar. Vol. 6. No. 1. pp. 91–93.

This is a summary of an important paper on the culture of the leprosy bacillus, and nearly constant specific reactions obtained with it in leprosy patients. The author in May 1933 reported in Bogotá the successful cultivation on Petragnani's medium of an acid-fast bacillus from the blood of nodular leprosy cases. He has since kept it in pure culture and made over forty subcultures. He now reports successful complement fixation tests with the organism cultivated from 20 out of 66 leprosy cases using a methylic antigen prepared by the technique of Boquet and Negret [Nègre?] in the case of the tubercle bacillus, and with Kolmer's complement deviation test. He has made 3,038 tests. These include 638 reactions with sera of clinically and bacteriologically confirmed lepers with 99·38 per cent. positive. Of 360 tests on clinically positive, but bacteriologically negative, patients, 92·5 per cent. gave positive reactions. Among 211 tests with sera of the children of lepers resident in leper colonies 11·38 were positive, and among the healthy living with leper relatives 18·48 per cent. were positive. In 160 persons considered to be cured, 38·12 per cent. were plus. On the other hand, among 264 persons with diseases other than leprosy only 1·52 per cent. were positive, and among 1,194 healthy persons only 0·09 per cent. gave reactions.

Tests by intradermal injections of "leprolina" made from the cultures gave positive reactions in healthy persons, but negative in leprosy patients, indicating the development of immunity in the latter. If the above results are confirmed an important advance will have accrued. *L. R.*

LLERAS ACOSTA (Federico). Pruebas de la especificidad de un bacilo aislado de la sangre de los leprosos. [**Tests of Specificity of a Bacillus isolated from the Blood of Lepers.**]—*Bol. Oficina Sanitaria Panamericana.* 1938. May. Vol. 17. No. 5. pp. 394–395.

[This is a later publication dealing with the same subject as the foregoing.]

In May 1933, Professor Lleras Acosta of the Bogotá School of Medicine informed the National Academy of Medicine that he had

succeeded in isolating from the blood of lepers suffering from the nodular form of the disease an acid-fast organism which he had cultivated in Petragnani's medium and which showed the morphological and grouping characters of Hansen's *Mycobacterium leprae*. He has kept the culture going for four years—fifty subculturings—and it maintains its original characters. He now states that with this organism complement fixation tests prove positive with the serum of lepers, negative with normal sera; also that a glycerin extract inoculated intradermically in non-leprous persons provokes an immunity reaction; that animal inoculation into guineapigs, rabbits, rats, mice, monkey (*M. rhesus*) and horse causes lesions which Bogotá pathologists regard as leprous, and lastly, when injected in lepers brings about modification of their lesions.

Of 638 tests with lepers, clinically definite and confirmed bacteriologically, 634 (99.3 per cent. gave positive serum reactions, the antigen being prepared in the same way as that of Boquet and Nègre for tubercle; of 360 lepers of the macular or maculo-anaesthetic type but not confirmed bacteriologically, the nasal mucus showing none, 333 (92·5 per cent.) were positive. Of 211 sera from children of lepers 24 (11·3 per cent.) were positive and of another 211 apparently healthy persons living with their leprous parents 39 (18·4 per cent.) were positive. Of 160 thought to be cured (by a Medical Board) 61 (38·1 per cent.) were still positive. Lastly, of 264 suffering from diseases other than leprosy 4 were positive and of 1,194 healthy persons one reacted.

H. H. S.

MUIR (E.). **The Erythrocyte Sedimentation Test in Leprosy.**—*Internat. Jl. Leprosy.* Manila. 1937. Oct.–Nov.–Dec. Vol. 5. No. 4. pp. 419–426. With 1 fig.

This paper describes the simple technique of the sedimentation test, and indicates its prognostic value and help in treatment on the lines previously described by the author. *L. R.*

MUIR (Ernest) & ROY (T. N.). **The Significance of Positive Wassermann and Kahn Reactions in Leprosy.**—*Leprosy Review.* 1938. Jan. Vol. 9. No. 1. pp. 13–18.

The authors report simultaneous and repeated Wassermann and Kahn tests in cases of leprosy in view of the frequency of positive reactions in cases showing no signs of syphilitic infection either clinical or post-mortem.

They conclude that in mild and early cases of leprosy positive reactions indicate coincident spirochaetal disease. On the other hand, in advanced cutaneous and mixed cases, especially those subject to attacks of lepra fever, a positive reaction by itself does not indicate syphilitic infection, as it may be due to some other factor, possibly connected with bacilluria. *L. R.*

GUNDERSEN (Edv.) & BERNER (Ole). Om Wassermanns reaksjon ved Lepra. [**Wassermann's Reaction in Leprosy.**]—*Norsk Mag. f. Laegevidenskapen.* 1938. Apr. Vol. 99. No. 4. pp. 353–378. German summary. [Summary appears also in *Bulletin of Hygiene.*]

The quite considerable literature on the subject of Wassermann's reaction in leprosy between 1908 and 1937 would lead one to suppose

that leprosy, the tubercular rather than the anaesthetic form, can give a positive Wassermann reaction. This conclusion, come to by observers in every part of the world where leprosy exists, means that the Wassermann reaction cannot be regarded as strictly specific for syphilis. Since 1926, however, the correctness of this conclusion has been challenged more and more, and the positive Wassermann reactions observed in cases of leprosy have been attributed to overlooked syphilis. Gundersen and Berner have examined the serum in 10 cases of lepra tuberosa, 11 of lepra maculo-anaesthetica, and five of lepra nervosa, and have found two in which the Wassermann, Kahn and Meinicke II reactions were positive. In one of these cases there was a definite history of syphilis for which injections of neosalvarsan had been given. This was a case of lepra tuberosa. In the other case, one of lepra maculo-anaesthetica, there was indeed no clinical history of syphilis in the 79-year-old woman who had worked in a very syphilitic milieu as a young woman. In spite of this very slender clinical evidence in favour of a syphilitic infection, Gundersen and Berner maintain that the serological evidence tallied well with a diagnosis of latent syphilis, and they say that " those who constantly have to do with latent syphilis know that one often meets individuals whose markedly positive Wassermann reactions persist in spite of age and all specific treatment and without any clinical evidence of neuro-syphilis." So, in their opinion, there was nothing in their researches to support the view that leprosy by itself can give rise to a positive Wassermann reaction. *C. Lillingston.*

RODRIGUEZ (Jose N.). **Observations on the Leprolin (Mitsuda) Reaction.** —*Monthly Bull. Bureau of Health.* Manila. 1937. Nov. Vol. 17. No. 11. pp. 389–408. [16 refs.] Also in *Internat. Jl. Leprosy.* Manila. 1938. Jan.–Mar. Vol. 6. No. 1. pp. 11–32. With 4 figs. on 1 plate. [16 refs.]

The author reports an investigation of the Mitsuda reaction with a view to elucidating its nature. He regards the negative results of injections of leprolin, prepared by making an emulsion of nodules containing numerous bacilli, in young infants as non-specific. On the other hand, the lack of response among cutaneous cases of leprosy is a condition of specific anergy. A positive reaction in such cases is a favourable sign although not necessarily a guarantee of early improvement to a negative bacteriological stage. The leprolin reaction differs from the tuberculin one in its maximum being delayed until about the end of the second week, instead of occurring after 48 hours. Some laboratory animals that are resistant to human leprosy fail to react to leprolin. *L. R.*

CAMPOS (Nelson Souza). Resultado do " Leprolin-Test " nos preventorios de filhos de leprosos. [**The Leprolin Test in Healthy Children of Lepers.**]—*Rev. Brasileira Leprologia.* S. Paulo. 1938. Mar. Vol. 6. No. 1. pp. 31–48. [12 refs.] English summary.

Authors have generally agreed that the leprolin test gives negative results in those who have never been in contact with lepers—because there has been no call for the development of antibodies. It is also negative in cases such as those of the cutaneous and mixed forms where the antigens greatly preponderate over the antibodies ; positive among those who have lived in association with lepers, although they

present no recognizable symptoms—specific antibodies having been produced by repeated infection with bacilli in small numbers; positive also in maculo-anaesthetic and tuberculoid cases with small lesions or lesions in which the bacilli are not seen, that is in cases where antibody formation has been active.

For their tests the authors used lepromine-Hansen prepared as follows, according to the method of Mitsuda-Hayashi :—

Fresh nodules are excised and the skin removed, and are heated in a water-bath in physiological saline for 40–60 minutes. They are then triturated, 1 gm. to 20 cc. saline, and sterilized; after filtration the filtrate is autoclaved. After addition of phenol to 0·5 per cent. the product is preserved in vials.

For those of 12 years or more 0·02 cc. is injected intradermically, for younger children half this dose, and the reaction observed on the eighth, fifteenth and twenty-first days. In all, 331 were tested, 174 boys, 157 girls; 31 under 3 years of age, 228 between 3 and 13 years, and 72 over 13 years. The number positive increased with advance in age; of those under 3 years 22·6 per cent. reacted, between 3 and 13 years 53·4 per cent., in those over 13 years 86 per cent. None of those who had been removed from their parents at birth gave any reaction, and the percentage positive increased with the length of time they were left with the parents. Between 1 and 12 months 45 per cent., 1–3 years 68 per cent., 3–5 years 74·2 per cent., and over 5 years 84·5 per cent. reacted positively. *H. H. S.*

PARMAKSON (P.). Ueber die Hautreaktion mit Leprolin bei Leprakranken und ihre klinische Verwertung. [**The Cutaneous Reaction with Leprolin and its Value.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1938. Mar. Vol. 42. No. 3. pp. 117–123.

The author reports on leprolin tests in 60 leprosy cases with negative reactions in 68·4 per cent. of tubercular, 22·3 per cent. of mixed and 6·6 per cent. of macular anaesthetic cases. His results also agree with others in showing a favourable prognosis with positive reactions and *vice versa*. *L. R.*

MCKINLEY (Earl B.). **The Present Status of Diagnostic Skin Tests in Leprosy.**—*Internat. Jl. Leprosy.* Manila. 1938. Jan.–Mar. Vol. 6. No. 1. pp. 33–46.

The author reports his experience of 5,174 skin tests with various acid-fast bacillus antigens. (This work has already been reviewed in this *Bulletin* 1938, Vol. 35, p. 295.) *L. R.*

NUZZI (Pasquale). La diagnosi precoce della lebbra. [**Early Diagnosis of Leprosy.**]—*Giorn. Ital. di Clin. Trop.* 1938. Mar. 31. Vol. 2. N.S. No. 3. pp. 74, 77–9. [15 refs.]

LIMA (Lauro de Souza). Sobre a moderna terapeutica anti-leprotica. [**The Modern Treatment of Leprosy.**] (la Monografia dos Arquivos do Sanatorio "Padre Bento").—91 pp. With 3 graphs. [Refs. in footnotes.] Departamento de Profilaxia da Lepra do Estado de S. Paulo. 1937. São Paulo: Soc. Impressora Paulista Ltda, Rua Scuvero, 152.

This work gives, with a wealth of detail, an account of the treatment of leprosy by means of chaulmoogra and its derivatives and the results attained at the "Padre Bento" leprosarium. The author deals with

the choice of drug, its methods of use, its dosage, duration of treatment, and the evaluation of results. A whole chapter is given up to the Plancha or intradermal infiltration method, originally tried out at the Culion Leper Colony in the Philippines; its main disadvantages are the pain of multiple pricks, the time taken, and the need for technical skill, but of these the first is the only one of any importance and it is often negligible because the site of injection is more or less anaesthetic. On the other hand its advantages are the almost complete absence of general reaction and usually only slight local reaction, an acceleration of resolution of the lesions treated, the general improvement and the psychological effect on the patient as he sees the disappearance of the lesion.

Evaluation of results in the Padre Bento Sanatorium is detailed, the cases being subdivided into a large number of groups. Briefly the results may be summarized by saying that of 500 patients treated for periods varying from six months to six years 271 (54 per cent.) were benefited, 155 (31) remained with the condition unchanged and 74 (15) became worse. He notes also the influences of other factors—age, type of disease, duration of treatment, etc., and draws the following conclusions :—

1. That chaulmoogra treatment at the Sanatorium has brought about improvement in a majority of the patients.
2. That to assess its value attention must be paid to the clinical and bacteriological results and not to the former only.
3. That special treatment of local lesions, the nasal for example, and of general adverse concomitant conditions, is necessary.
4. That chaulmoogra did not seem to have any effect on ocular lesions. *H. H. S.*

Ryrie (G. A.). **The Treatment of Tuberculoid Leprosy.**—*Leprosy Review.* 1938. Apr. Vol. 9. No. 2. pp. 51–55.

A report of trials of different methods with controls.

Experience at the Sungei Buloh leper institution of Malaya showed that intradermal chaulmoogra ester injections produced little benefit in the majority of tuberculoid forms of leprosy, although the best method in the cutaneous variety with abundant lepra bacilli. Trials of different methods were therefore made in groups of twenty adult males, beginning with a control group given only injections of normal saline. This proved a popular method on account of its painlessness, but it had only a psychological effect, for after four months half the cases were slightly worse. In a second group 3 grains of phthalic acid dissolved in 5 cc. of hydnocarpus oil produced acute inflammation on injection, and in a third group intradermal esters had also to be given up for the same reason. The fourth group was treated with large subcutaneous doses of 1 cc. of hydnocarpus oil for each 10 pounds of body weight for four months, with 2 stationary, 20 improved and 2 worse, and this has proved the best method of treatment. Phthalic acid intravenously in a 2 per cent. solution caused reactivation and retrogression, so was definitely harmful. *L. R.*

Ryrie (Gordon A.). **The Treatment of Leprosy.**—*Jl. Malaya Branch Brit. Med. Assoc.* 1938. Mar. Vol. 1. No. 4. pp. 305–315.

This is a useful guide for those with little experience of the disease. It includes much of the information in the foregoing paper, together with simple information on diagnosis and classification. *L. R.*

LOWE (J.) & DE (N. K.). **Tests of the Suitability of Hydnocarpus Oil for Injection.**—*Leprosy Review.* 1938. Jan. Vol. 9. No. 1. pp. 32–36.

This note gives much practical information on this important subject. The main points are that the oil should be prepared from fresh fruits after removal of the dirty outside of the seeds, and filtered to remove such impurities. To detect adulteration the specific rotation of a good oil should be from 53° to 57°. It should be stored in full bottles in cool shade to prevent oxidation and not used after one year. The acidity should be less than 3 per cent., and in a good oil may be less than 1 per cent. Only a small amount of peroxides should be present. For tests for estimating such impurities the original paper must be referred to. *L. R.*

LE QUÉREC (M.). L'insaponifiable de l'huile de chaulmoogra. [**Unsaponifiable Chaulmoogra Oil.**]—*Bull. Soc. Path. Exot.* 1937. Dec. 8. Vol. 30. No. 10. pp. 889–891.

This paper deals with the isolation of an unsaponifiable fraction of *H. anthelmintica* oil, and its trial in a few cases of leprosy with negative results. *L. R.*

TISSEUIL (J.). Action comparée des huiles d'olive et de chaulmoogra en injection intradermique. [**Olive and Chaulmoogra Oils Intradermally.**]—*Bull. Soc. Path. Exot.* 1938. Mar. 9. Vol. 31. No. 3. pp. 231–233.

In this note the author compares the action of intradermic injections into tuberculoid leprosy lesions of chaulmoogra and olive oil respectively. The chaulmoogra oil produced disappearance of the leprous infiltration, but olive oil had no effect on the lesions. *L.R.*

BERG & NODENOT (L.). Observation d'un cas de lèpre cutanéo-muqueuse traitée et améliorée par le bleu de méthylène. [**A Case of Mucocutaneous Leprosy treated by Methylene Blue. Improvement.**]—*Bull. Soc. Path. Exot.* 1938. Feb. 9. Vol. 31. No. 2. pp. 92–94.

PIÉRI, SARDOU & BATTESTI. Lèpre mixte traitée par le bleu et l'hyrganol ; présence de bacilles dans le sang périphérique. [**A Case of Mixed Leprosy treated by Methylene-Blue and Hyrganol.**]—*Marseille-Méd.* 1937. Sept. 5–15. Vol. 74. No. 25–26. pp. 209–211.

DE RAADT (O. L. E.) & PARJONO (R.). De phenoltherapie der lepra en tuberculose (2de Mededeeling). [**Phenol Treatment of Leprosy and Tuberculosis.**]—*Geneesk. Tijdschr. v. Nederl. Indië.* 1938. Feb. 22. Vol. 78. No. 8. pp. 435–439. With 12 figs. on 3 plates.

MARTY (J.). La sympathectomie péri-artérielle dans le traitement des ulcères de la lèpre nerveuse [**Sympathectomy for Perforating Ulcers.**]—*Bull. Soc. Path. Exot.* 1938. Mar. 9. Vol. 31. No. 3. pp. 199–201.

The author records four cases of perforating ulcer of the foot in which healing took place shortly after femoral sympathectomy.

Three have not been followed up for long, and the remaining case has developed ulceration of the other foot, so this treatment should be combined with medicinal methods. *L. R.*

GOLOVINE (S.). Essais sur le traitement des cas de lèpre à réaction syphilitique positive. [**Treatment of Lepers with Syphilitic Reactions.**]—*Bull. Soc. Path. Exot.* 1937. Dec. 8. Vol. 30. No. 10. pp. 839–843. [20 refs.]

The author agrees with the view that the presence of syphilitic infection makes the treatment of leprosy more difficult. He has used antisyphilitic treatment in 42 cases with positive reactions, and followed them up long enough to judge. He finds the mixed treatment much more rapidly beneficial than simple anti-leprosy medication.

L. R.

NODENOT (L.). Sur un cas d'incompatibilité des traitements anti-syphilitiques et antilépreux. [**Incompatibility of Anti-Leprotic and Anti-Syphilitic Treatment.**]—*Bull. Soc. Path. Exot.* 1937. Dec. 8. Vol. 30. No. 10. pp. 843–845.

This is a brief report of a case of leprosy complicated by syphilitic ulceration of the palate with perforation, in which anti-leprotic treatment proved harmful, but healing took place under anti-syphilitic treatment alone. *L. R.*

KEIL (Ernst). Ist Nervenlepra ätiologisch einheitlich ? Zur Vitamin B_1-Behandlung der Nervenlepra. [**Vitamin B_1 in Nerve Leprosy.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1938. Jan. Vol. 42. No. 1. pp. 1–13. [68 refs.]

The author discusses whether the aetiology of nerve leprosy is always uniform. He points out that, as in vitamin B deficiency, the peripheral nerves supplying the distal portions of the extremities are attacked. He therefore suggests the trial of Vitamin B_1 in nerve leprosy, and thinks that the use of efficient doses will be facilitated when it can be made simply by synthesis. *L. R.*

MCCOY (G. W.). **Communicability of Leprosy and Application of Control Measures.**—*Arch. Dermat. & Syph.* 1938. Feb. Vol. 37. No. 2. pp. 169–174.

This is a brief general discussion of the question by an American authority.

The transmission of the disease is first discussed. Racial susceptibility is doubtful. Transmission within the family is important, but predisposition and the predisposing influence of other diseases is questioned. The exact mode of transmission is uncertain. Isolation measures of a rigorous nature have been most relied on, but he holds that "there is no real proof of the efficacy of segregation as a measure of public health," largely on account of the difficulty of finding early cases. There is no substantial evidence that the vigorous measures taken in the Philippines have reduced the number of lepers

in the islands. He would therefore be lenient in the release of patients with arrested manifestations.

The above paper is followed by one by C. F. LEHMANN of a clinical nature.

CAIGER (Herbert), LYTLE (W. J.) & NUNAN (Joseph). **The Anti-Leprosy Campaign and the "Keep Fit" Campaign.** [Correspondence.]—*Brit. Med. Jl.* 1937. Dec. 25. pp. 1300–1301.

This letter deals with a contention that the leprosy problem in the tropics is insignificant compared with such diseases as malaria. It is pointed out that a comparatively low morbidity rate of leprosy is accompanied by a very severe degree of suffering of a most prolonged nature, which makes it an eminently suitable subject of such a charitable organization as the British Empire Leprosy Relief Association. The patients in leprosy colonies also learn much regarding diet, cleanliness and health precautions, which make the recovered leper a potent influence for good when he returns to his village. *L. R.*

DALGAMOUNI (Mohamed Abdel Khalik el). **The Antileprosy Campaign in Egypt.**—*Internat. Jl. Leprosy.* Manila. 1938. Jan.–Mar. Vol. 6. No. 1. pp. 1–10. With 1 fig. (map) & 3 plates.

This is a brief description of recent work in Egypt.

After a reference to the early history of leprosy the author goes on to describe the campaign against the disease commenced under him in 1929, after a visit to India and the Far East to see the work there. Clinics were first started, and followed up with two colonies for infective cases, with branch clinics associated with them and visited in motors to enable weekly injections to be given to a larger number of patients at twenty centres, which proved very successful. Among 9,194 persons examined at clinics 4,387 or 47·7 per cent., were found to be suffering from leprosy, and the total number is estimated at 15,000 in Egypt. In 45·4 per cent. the onset was in the first two decades of life, and another 30·6 per cent. in the third decade, as in other countries. Funds were granted in 1937 to enable three new provincial clinics with 12 branches to be opened. A good start has thus been made in tackling the ancient leprosy problem in Egypt.

L. R.

DE SOUZA-ARAUJO (H. C.). A lepra no Espirito Santo e a sua prophylaxia. A "Colonia de Itanhenga"—Leprosario modelo. [**Leprosy in Espirito Santo and its Prophylaxis.**]—*Mem. Inst. Oswaldo Cruz.* 1937. Vol. 32. No. 4. pp. 551–605. With 23 plates, 4 maps & 1 plan. [12 refs.]

MERIC (J.). Nos lépreux et les Commissions de Réforme Militaire. [**Leprosy Commission.**]—*Mouvement Sanitaire.* 1937. Dec. Vol. 14. No. 164. pp. 650–652.

MONTHLY BULLETIN OF THE BUREAU OF HEALTH. Manila. 1937. Oct. Vol. 17. No. 10. pp. 371–374.—Questions frequently asked about Leprosy.

LEHMANN (C. F.). Leprosy. A Review of Some of its Unusual Features. —*Arch. Dermat. & Syph.* 1938. Feb. Vol. 37. No. 2. pp. 175–190. With 6 figs. [39 refs.]

GUSHUE-TAYLOR (G.). Rakusanen, "Happy Mount Leprosy Colony," Formosa.—*Internat. Jl. Leprosy.* 1938. Jan.–Mar. Vol. 6. No. 1. pp. 57–60. With 1 plate.

KRIZ (Joseph R.). Experimental Lesions induced in the Rabbit with the Acid-fast Chromogenic Bacillus (Duval) from Human Leprosy.—*Amer. Jl. Trop. Med.* 1938. Mar. Vol. 18. No. 2. pp. 213–224. With 8 figs. on 2 plates.

WATANABE (Yoshimasa) & NONAKA (Nobu). **Experimental Studies on Chickens concerning Leprosy. (Inoculation Test with Human and Rat Leprosy.)**—*Kitasato Arch. Experim. Med.* 1938. Jan. Vol. 15. No. 1. pp. 40–44. With 3 figs. on 1 plate.

The following are the results of this work. Considerable pathological changes, with numerous acid-fast bacilli, were produced at the site of inoculation of chickens with rat leprosy material, but little change in the internal organs. In the case of chickens inoculated with human leprosy material comparatively mild local, but more pronounced internal changes, resulted. In course of time the bacilli get fewer and the lesions regress. The inoculation of animals may therefore be used to differentiate between the bacilli of leprosy and of tuberculosis.

L. R.

SATÔ (Yuzô). Rattenlepra. III. Teil: Histologische Untersuchungen. [**Histology of Rat Leprosy.**]—*Japanese Jl. Dermat. & Urol.* 1937. Dec. 20. Vol. 42. No. 6. pp. 329–332.

This is a detailed description of the histology of rat leprosy which does not lend itself to extraction. It does not appear to contain anything new. *L. R.*

SATÔ (Masaru). Rattenlepra. IV. Teil: Bakteriologisch-serologische Untersuchungen. [**Rat Leprosy.**]—*Japanese Jl. Dermat. & Urol.* 1938. Jan. 20. Vol. 43. No. 1. pp. 16–21. With 2 figs.

This paper deals further with the bacteriology and serology of rat leprosy.

The rat leprosy bacillus cannot yet be cultivated and the disease reproduced by its inoculation. Its appearance in glands is illustrated, and its staining properties contrasted with those of other acid-fast bacilli in a table. The effect of heat on it shows that the rat leprosy bacillus is killed at 56°C. in 30 minutes and at 70°C. and upwards in 5 minutes, as well as by such antiseptics as 5 per cent. carbolic acid or 1 in 1,000 mercury perchloride. Cultures from 30 infected wild rats yielded 14 strains of various acid-fast bacilli producing different coloured cultures, but these were saprophytic in nature. Serological tests were carried out with a variety of antigens, prepared from leprosy and tubercle tissues among others, and the results are recorded in an elaborate table. Leprosy infected rats gave reactions with different antigens in from 0 to 25 per cent. of the cases, but healthy white rats gave uniformly negative results. In human leprosy infections from 5 per cent. to 100 per cent. of reactions were obtained with various antigens, and negative ones in all healthy control patients. *L. R.*

KUDICKE (R.) & VOLLMAR (H.). Gewebekulturversuche mit den Bazillen der Rattenlepra. [**Tissue Cultures of Rat Leprosy Bacilli.**]—*Zent. f. Bakt.* I. Abt. Orig. 1937. Vol. 140. No. 3/8. Beiheft pp. 293*–297*. With 2 figs.

The authors' researches on this subject are recorded and illustrated. Colonies of the rat leprosy bacillus were observed in tissue cultures, and also numerous organisms within individual cells. They proved to be positive up to 100 days in the case of lepromata and in subcuticular tissues respectively alone, and up to 73 days in the case of infected gland tissue, and for intermediate periods in the case of mixed lepromatous and either subcuticular or sarcomatous tissues. Moreover, under the conditions of the tissue cultures the organisms remained infective for certainly up to 22 days, and in the case of relatively bacillus rich tissues occasionally up to 89 to 100 days. *L. R.*

LAMPE (P. H. J.) & LOBEL (L. W. M.). Rattenlepra. Zesde mededeeling: Experimenteele contact- en voedingsinfectie van witte ratten. [**Rat Leprosy, Experimental Contact Infection.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1938. Jan. 25. Vol. 78. No. 4. pp. 179–190. With 2 figs. on 1 plate. English summary.

The authors record the following results from contact infection of rat leprosy. Young white rats became infected on close contact with white rats with leprous skin lesions. The contact included clawing, biting and cannibalism, but ectoparasites were not observed and could be excluded. Glandular forms of rat leprosy failed to infect healthy young white rats, so the method of infection in this common form of the disease is uncertain. *L. R.*

PRUDHOMME (R. O.). L'acide ascorbique dans la lèpre murine. [**Ascorbic Acid in Rat Leprosy.**]—*C. R. Soc. Biol.* 1937. Vol. 126. No. 33. pp. 1004–1005.

This short note records estimations of ascorbic acid in rat leprosy lesions. These showed the affected tissues to be very rich in this vitamin, which was present in the supernatant fluid after centrifuging an emulsion of a leproma. There was a nearly constant relationship between the amount in the spleen and in a leproma. Cells nearly destroyed by a mass of the bacilli showed more of the vitamin than normal cells. *L. R.*

TANGUY (Y.). Action de l'oléate et du laurate d'éthyle sur l'évolution de la lèpre murine expérimentale. [**Ethyl Oleates and Laurates in Rat Leprosy.**]—*Bull. Soc. Path. Exot.* 1937. Dec. 8. Vol. 30. No. 10. p. 848.

Trials of these substances in tuberculosis led the author to test them in rat leprosy. The results indicated that they are of little value. *L. R.*

BERNY (P.) & TANGUY (Y.). Conservation de la vitalité du bacille de Stefansky chez le cobaye. [**Vitality of Rat Leprosy Bacilli in Guineapigs.**]—*Bull. Soc. Path. Exot.* 1938. Jan. 12. Vol. 31. No. 1. pp. 40–42.

The authors had previously found that the Stefansky bacilli of rat leprosy can preserve their pathogenicity in guineapigs up to 39 days. They now extend this period to at least two months. *L. R.*

MALARIA.

LEAGUE OF NATIONS. Geneva. **The Treatment of Malaria. Fourth General Report of the Malaria Commission and Appendices.**—Off-print No. 5 from the *Bulletin of the Health Organisation.* 558 pp. Ill.

The Fourth General Report of the Malaria Commission has already been reviewed [see this *Bulletin*, 1938, Vol. 35, p. 408]. As regards the various appendices abstracts have already appeared of some of these [see this *Bulletin*, 1938, Vol. 35, pp. 36, 408, 422] others are in the press and will appear in a forthcoming issue. *H. H. S.*

HILL (Roy A.) & GOODWIN (M. H.), Jr. **"Prontosil" in Treatment of Malaria. Report of 100 Cases.**—*Southern Med. Jl.* 1937. Dec. Vol. 30. No. 12. pp. 1170–1172. With 1 graph & 1 chart. [12 refs.]

The hundred patients observed in this experiment were taken from an area where malaria is hyperendemic throughout the year. Seven were cases of *vivax* infection, the remainder *falciparum.* All had parasites in the peripheral blood when treatment began and the temperature of the cases ranged between 100 and 104°F. In most cases prontosil was given intramuscularly, 10 cc. every 12 hours. It was seldom necessary to give more than four injections. Usually after the first injection there was marked improvement and cessation of fever. After four injections most patients were able to return to work. No relapses had been noted up to the first half of October (the experiment began on August 1st) but there were two cases of reinfection 29 and 31 days respectively after the completion of treatment. Apparently the more severe the symptoms the more rapidly the drug acted.

Norman White.

PUBLIC HEALTH REPORTS. 1937. Oct. 15. Vol. 52. No. 42. pp. 1460–1462.—**Treatment of Malaria with Sulfonamide Compounds.**

This is a translation of a note by Dr. Amonario DÍAZ DE LEÓN, of Cardenas, San Luis Potosi, Mexico, who has treated 15 cases of benign tertian malaria with rubiazol (prontosil) with completely satisfactory results. The drug was given in tablet form, except for one patient who received one intramuscular injection. He considers rubiazol to be an effective specific drug for *vivax* infections. The Editor of the Public Health Reports believes this to be the first report on the use of sulphonamide compounds in the treatment of malaria. *N. W.*

DÍAZ DE LEÓN (Amonario). Primeros casos de paludismo tratados por un derivado de la sulfanilamida. [**First Cases of Malaria treated with Sulphonamide Derivatives.**]—*Bol. Oficina Sanitaria Panamericana.* 1937. Nov. Vol. 16. No. 11. pp. 1039–1040.

See above.

READ (Héctor) & PINO (Jaime Oliver). Versuche mit den Sulfonamid-Präparaten bei der Malariabehandlung. [**Investigations on the Treatment of Malaria by Sulphonamide Preparations.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1938. Mar. Vol. 42. No. 3. pp. 132–134.

The authors conclude from their observations on cases of benign tertian malaria that sulphonamide has a poor specific antimalarial action because it has neither a sufficiently definite schizontocidal action, nor is it a noteworthy gametocide. *E. D. W. Greig.*

FARINAUD (M.). Essais de chimioprophylaxie du paludisme par le traitement des porteurs d'hématozoaires à l'aide des médicaments synthétiques. [**Treatment of Malaria Parasite Carriers with Synthetic Drugs.**]—*Bull. Soc. Path. Exot.* 1938. Feb. 9. Vol. 31. No. 2. pp. 163–167.

LAVERGNE (J.). Remarques sur la communication de M. le docteur Farinaud.—*Ibid.* pp. 167–169.

School-children to the number of 322 in Antsirabe and in two other equally malarious localities in Madagascar, all of whom were harbouring malaria parasites, were treated with quinacrine for five days followed by rhodoquine for 3 days. Some of the children received only one such treatment ; others received a second course of treatment three months after the first. The blood was re-examined 15 days to a month after the completion of treatment. The percentage of children who were free from parasites was 71 to 76 in the case of two groups of children that had received but a single treatment, and 94 and 96 in the case of two other groups that had received two courses of treatment. No gamete carriers were found after treatment. A few children were completely refractory to the treatment.

Dr. Lavergne also considered that for collective prophylaxis the synthetic remedies give better results than quinine. Given weekly, or bi-monthly, the cost is somewhat less than daily dosage with quinine, and the action of rhodoquine or praequine on the gametes is a great advantage. He has been very favourably impressed with the extreme efficacy and perfect innocuity of rhodoquine. Quinacrine is an irritant to the digestive mucosa and it is important not to administer the drug on an empty stomach : if this precaution be taken digestive troubles will rarely follow its use. Helminths sometimes render the host intolerant of quinacrine. *N. W.*

MÜHLENS (P.). "Certuna", ein neues Tropikagametenmittel. [**"Certuna", a New Gametocide in Malignant Tertian Malaria.**]—*Deut. Med. Woch.* 1938. Feb. 25. Vol. 64. No. 9. pp. 295–297.

The author describes his observations in 113 cases of malaria over a period of 2½ years with this drug. Certuna (Bayer) is put up in tablets for oral administration (chemically it is, dialkylamino-oxy-quinolylaminobutane). When given in doses of 0·02 gm. daily for 5 days the author has not observed any toxic signs, *e.g.*, cyanosis of lips, and no formation of methaemoglobin. In severe cases of malignant tertian malaria he recommends an intramuscular injection of 0·3 gm. atebrin musonate, then atebrin by the mouth for 4 days more in doses of 0·1 gm. thrice daily. After the temperature has come to normal

or in cases when there is no fever, but numerous crescents have been determined in the blood, then give on three successive days Certuna in doses of 0·01 gm. simultaneously with atebrin 0·1 gm. thrice daily. In persons of heavier body-weight and in all cases with very numerous crescents Certuna may be given in doses of 0·02 gm. thrice daily. It was shown that the crescents ceased to flagellate on the second day of the administration of Certuna in doses of 0·02 gm. thrice daily. Also a daily dose of 3 tablets of 0·01 gm. Certuna was found to render the crescents, after the second day, incapable of further development in the mosquito. He found that the daily administration of three tablets of Certuna of 0·01 or 0·02 gm. for at least 3 days was well tolerated and the crescents had almost always disappeared from the blood at latest in 4 to 7 days. He considers Certuna is superior to plasmoquine as a gametocide in malignant tertian malaria.

E. D. W. Greig.

SIOLI (F.). Prüfung des neuen Malariamittels "Certuna" bei der Impfmalaria der Paralytiker. [**Evaluation of the New Malaria Drug, "Certuna," in Inoculation Malaria in Cases of General Paralysis.**]—*Klin. Woch.* 1938. Apr. 9. Vol. 17. No. 15. pp. 527–528. With 3 figs.

The author refers to the paper of KIKUTH on this drug in the same number of the Journal. He makes it clear that the results of the tests carried out in cases of general paralysis inoculated with benign tertian parasites must be regarded only as a link in the chain of evidence, which must be supplemented by extensive investigations by tropical practitioners in the field. He commenced with small doses 0·01 gm. but was soon able to increase the dose till he gave 0·07 gm. thrice daily for 7 days without observing any ill effect and he was also able to give it simultaneously with atebrin without toxic signs, in the latter respect it is an advance on plasmoquine. He concludes from his observations in benign tertian malaria that "Certuna" is well tolerated and is active. Its activity differs from the action of quinine, plasmoquine and atebrin in that a cure with Certuna, even in large doses, is not attained, but only a temporary suppression of the febrile attacks and parasites. The new drug will require to be subjected to further research elsewhere to differentiate accurately its active principles.

E. D. W. Greig.

KIKUTH (Walter). Zur Weiterentwicklung der Chemotherapie der Malaria. "Certuna"—ein neues Gametenmittel. [**On the Further Development of the Chemotherapy of Malaria. Certuna—a New Gametocidal Agent.**]—*Klin. Woch.* 1938. Apr. 9. Vol. 17. No. 15. pp. 524–527.

The author gives a brief historical survey of the malaria problem and cites the views of ROSS and KOCH on the best method of attack. After indicating certain drawbacks to quinine therapy, he notes the new impulse which was given to chemotherapy by the study of bird malaria and the discovery of plasmoquine. The latter is an active gametocidal agent and also prevents the gametocytes from carrying on the cycle in the mosquito. It has lowered the relapse rate and shortened the period of treatment. The drug, however, suffers from several disadvantages in that clinical symptoms are only temporarily allayed,

and it may give rise to methaemoglobin, blue lips and finger nails as well as severe epigastric pains, especially when given in certain proportions with atebrin.

These disadvantages induced the author to seek a new gametocidal substance lacking the secondary manifestations of plasmoquine. He uses a method developed by himself to test gametocidal power, in which the exflaggellation of male gametocytes (*P. cathemerium*) and fertilization of the female can be followed. A dose of the drug in question is given and the effect on exflagellation studied after one hour. Small structural changes in the drug may greatly modify the experimental results and can only be studied in this way. The author's results do not always agree with those obtained by the Roehl technique, nor with those on *Haemoproteus* infections in finches. The method offers technical difficulties and many controls are required.

By this method the author claims to have discovered a substance superior to plasmoquine. It is a dialkylamino-oxyquinolylamino-butane, and has been given the name "Certuna." Tests have been carried out on this drug in conjunction with plasmoquine. The toxicity when given by mouth to birds on six consecutive days corresponds to that of the latter drug. Therapeutically it is inferior to plasmoquine in malignant tertian malaria but shows marked gametocidal powers. Certuna is about twice as efficacious in the *Haemoproteus* infection of finches and in exflagellation experiments likewise proves superior. There are no secondary manifestations in human cases, and the new drug being compatible can be administered with atebrin. Small doses of the drug, not sufficient to prevent fertilization of female gametocytes, can yet, at a certain stage, arrest the further development of the oöcyst in the epithelium of the mosquito's stomach.

J. D. Fulton.

MISSIROLI (A.) & MOSNA (E.). La sterilizzazione dei gametociti dei plasmodi malarici. [**Sterilization of Gametocytes of the Malaria Plasmodium.**]—*Riv. di Parassit.* Rome. 1938. Jan. Vol. 2. No. 1. pp. 55–71. English summary (5 lines).

This report details the results of experiments with "Cilional" as a gametocide. This drug, to which SCHULEMANN, its author, has provisionally given the name "Cilional," was found by him to have a fourfold greater action on the gametocytes of *Haemoproteus* of the chaffinch than has plasmoquine. It belongs to the plasmoquine series of preparations and has the composition dialkylamino-alkyl-amino-oxy-quinoline. Its action on the gametes of *Pl. falciparum* is quite as potent as that of plasmoquine and that in doses far less than any that produce toxic symptoms. In that respect it is far superior to plasmoquine. A dose of 12 cgm. a day for six consecutive days was given to a patient without producing any ill effects: a dose of 2 cgm. a day for a similar period of time is a suitable therapeutic dose.

The paper details the results of experimental observations on a series of *falciparum* gamete carriers treated with varying doses of Cilional in which the gametes were enumerated, flagellation of the gametes looked for, and the infectivity of the blood for anophelines was determined each day for a week following the administration of the

drug. A field experiment was also carried out in Zapponeta (Foggia), with a population of about 1,000, where malaria is hyperendemic. From the 1st May to the 15th October, 1937, Cilional was given to practically the whole population every three days. Infants up to one year had 1 cgm. ; children from 1 to 6 years, 2 cgm. ; from 6 to 12 years, 3 cgm. ; from 12 to 19 years, 5 cgm. ; adults, 6 cgm. Whereas *vivax* infections were somewhat more numerous than they had been in 1936 *falciparum* infections showed a marked reduction. In the 4 months August–November only two *falciparum* gamete carriers were discovered as compared with 36 in the corresponding period of the previous year. The authors conclude that the addition of such a drug to quinine or atebrin will give us a complete anti-malaria remedy, thus making possible the human "bonifica" envisaged by Koch, Golgi and Gossio. *N. W.*

de Sant'ana Queiroz (José). Sull'azione dei medicamenti nelle varie fasi di sviluppo dei parassiti malarici. [**Action of Drugs on Different Stages of Development of the Malaria Parasite.**]—*Riv. di Parassit.* Rome. 1938. Jan. Vol. 2. No. 1. pp. 13–21. With 24 coloured figs. on 1 plate. English summary (5 lines).

The observations recorded in this paper were carried out on five *Macacus rhesus* infected by intramuscular injection of 1 cc. of blood of another *M. rhesus* which harboured very numerous parasites of *Pl. knowlesi*. All the monkeys showed parasites in the peripheral blood on the 6th to 8th day ; these increased rapidly in numbers during the following two to four days. The drug used has the chemical composition of atebrin and was manufactured in Italy. In one monkey the drug was given when the majority of the parasites were small ring forms ; in a second monkey when the ring forms were in a later stage of development ; in a third monkey when the division of the chromatin was taking place, the schizogony phase ; in the fourth monkey when numerous rosettes were present. The fifth monkey was an untreated control. The blood of each monkey was examined every two hours after the administration of the drug, for 24 hours, and the number of parasites per 100 red cells was noted on each examination. The drug was progressively more active as the development of the parasites in the red cells progressed ; it was most active when given at the stage of chromatin division. At a later stage when sporulation was taking place the drug had much less effect. *N. W.*

Monaco (A.), Cito (V.) & Mangiacapra (A.). Cura antimalarica col metodo di Maurizio Ascoli. [**Ascoli's Method of Treatment.**]—*Riforma Med.* 1937. Oct. 23. Vol. 53. No. 43. pp. 1507–1511.

This is a detailed account of six cases of malaria treated by Ascoli's method, the intravenous injection of adrenalin. Three of the cases had been infected within the previous year ; the other cases were of longer duration with very hard spleens. Three were *vivax* infections, two *falciparum*, and one quartan. In all the results of treatment were very satisfactory. The authors emphasize the value of this form of treatment in military practice. *N. W.*

PIZZILLO (Giuseppe). Sulla cura di Maurizio Ascoli nelle infezioni malariche. Nota VIII. Tipi e ritmi di splenoriduzione. [**Form and Rhythm of Reduction in Size of Spleen resulting from Ascoli's Method of Treatment of Malaria Infections.**]—*Riv. di Malariologia.* Sez. I. 1937. Vol. 16. No. 6. pp. 441–445. With 5 charts.

The observations recorded are based on the study of a hundred cases of malarial splenomegaly treated by Ascoli's method. In the process of reduction in size the spleen undergoes alternating contraction and re-expansion, and also change in shape, as a result of the action of adrenalin. The extent of the rhythmic contractions and expansions and the rate of permanent decrease in spleen volume differ in different cases. The author describes and figures five types of reaction of the spleen to adrenalin, to one or other of which most cases can be referred.

N. W.

ACANFORA (G.). Sulla cura dell'infezione malarica cronica col metodo di Maurizio Ascoli. [**Treatment of Chronic Malaria by Ascoli's Method.**]—*Policlinico.* Sez. Prat. 1938. Feb. 21. Vol. 45. No. 8. pp. 333–4, 337–9, 3 figs. [34 refs.]

This is another description of Ascoli's treatment of chronic malaria. "Surrenasi Serono," a standardized, deproteinized preparation of adrenalin prepared by the National Medico Pharmacological Institute Sereno of Rome, is used for the intravenous injections. It retains its potency for a long period. Five illustrative cases, all with very large spleens, are described. In all the results of treatment were very satisfactory. Not only were the spleens remarkably reduced in size but there was also a very noteworthy improvement in the patient's general condition. *N. W.*

SETZU (Alverio). Rilievi sulla terapia adrenalinica endovenosa della malaria secondo Maurizio Ascoli. [**Ascoli's Treatment of Malaria by Intravenous Adrenalin.**]—*Riv. Sanitaria Siciliana.* 1938. Feb. 1. Vol. 26. No. 3. pp. 134, 137–8, 141–2.

SCADUTO (Pasquale). Il metodo di Maurizio Ascoli per la cura delle recidive malariche, in alcuni indigeni Libici. [**Ascoli's Method in Treatment of Malaria Relapses.**]—*Riv. di Malariologia.* Sez. I. 1938. Vol. 17. No. 1. pp. 37–43. [13 refs.] French summary (3 lines).

NAPIER (L. Everard). The Specific Treatment of Malaria. (Being a Résumé of a Lecture.)—*Indian Med. Gaz.* 1938. Mar. Vol. 73. No. 3. pp. 160–165. With 2 figs.

DUPOUX (Robert), MARINI (Charles) & BARTHAS (Raymond). Résultats des expériences de prophylaxie collective antipaludique en Tunisie. [**Mass Prophylaxis of Malaria in Tunis.**]—*Bull. Acad. Méd.* 1937. Nov. 23. 101st Year. 3rd Ser. Vol. 118. No. 35. pp. 368–372.

The Cape Bon peninsula in Tunis was the region in which this interesting experiment in drug prophylaxis was carried out. It is one of the most intensely malarious regions in Tunis; anopheline breeding places (*maculipennis*, *algeriensis* and *hispaniola*) are very numerous and would be difficult or impossible to eradicate or control.

The only drug used was premaline in tablet form. A tablet of premaline contains quinacrine 0·10 gm., rhodoquine 0·005 gm. and praequine 0·005 gm. The experiment began on the 1st June, 1936, and the administration of the drug was continued till the 15th November. The number of persons submitted to treatment was 27,097 of whom 10,021 were children from 0 to 12 years of age. Tablets were given at intervals of ten days during the first month, thereafter twice a month. Adults were given three tablets: children received proportionally smaller doses, infants from six months to one year receiving half a tablet. Spleen, parasite and gamete indices were established for the whole population before, during and after treatment. These were all very high but fell remarkably during the course of treatment. Clinical relapses were very rare except among those who had failed to take the drug. In certain individuals parasites could be found in the blood throughout the treatment in spite of which they suffered no inconvenience and were able to follow their normal agricultural occupations. Symptoms of intolerance were rare and of no importance. The cost of the experiment worked out at 20 francs per head; this is only half the cost that the daily administration of quinine would have incurred. Twenty-one nurses, male and female, were employed in the work; the drug was taken in their presence. One-seventh of the total cost was the cost of staff. The diminution of the indices noted in December after the administration of the drug had ceased was well maintained till the following May when another season's campaign was about to start. The authors are enthusiastic about the results achieved. *N. W.*

WINCHESTER (M. E.). **Individual Chemoprophylaxis of Malaria Report of Second Year's Investigation.**—*Southern Med. Jl.* 1937. Dec. Vol. 30. No. 12. pp. 1172–1174.

This is a report on the prophylactic value of atebrin. The author's previous report on this subject was noted in this *Bulletin*, 1937, Vol. 34, p. 218. The observations now reported were carried out in 1936 and concerned 426 persons in a prophylactic group and 202 persons in a control group. Both groups were from the same areas. On 1st May all persons who had suffered from "chills and fever" during the previous six months, or who had parasites in the blood, in both groups, were given a five days' course of atebrin, 0·3 gm. a day. Members of the prophylactic group thereafter took a tablet of atebrin, 0·05 gm., each evening till the end of October. This was the adult dose; smaller doses were given to children according to age. Among the controls there were 49 cases of clinical malaria during the season, 24·3 per cent. There was no case in the prophylactic group. In November the parasite index of the control group was 19·8 per cent.; no parasite carrier was found in the prophylactic group. Ninety per cent. of the cases observed were *falciparum* infections. *N. W.*

WHITE (R. Senior) & ADHIKARI (A. K.). **Anti-Gametocyte Treatment combined with Anti-Larval Malaria Control. Part II.**—*Records of the Malaria Survey of India.* 1937. Dec. Vol. 7. No. 4. pp. 221–231.

The first part of this paper (this *Bulletin* 1935, Vol. 32, 2, p. 141) showed that a single course of quinine and plasmoquine given

at the beginning of the malaria season to all children living in a Railway Settlement under anopheline control caused no permanent improvement. In 1936 another opportunity occurred of studying the matter further, in the same district. A labour camp established in connection with repairs to a tunnel had an average labour strength of 308. One-fifth of the total force was changed within the first month and within three months half the original force had left. The total number of persons employed on this work during nine months was 662. All arrivals at the camp received five days' treatment with atebrin, 0·3 gm. a day, followed, after five days, by a single dose of plasmoquine 0·02 gm. Thereafter everyone received a similar dose of plasmoquine once a week. The work proceeded from start to finish without any delay caused by malaria and that in a district where past experience has shown that uncontrolled malaria works havoc with engineering operations. Though it was not possible to measure the additional benefit conferred by this anti-gametocyte measure the authors consider it to be too small to justify the additional cost where anti-larval measures can receive adequate attention. *N. W.*

ROUBAUD (E.). Principes et possibilités de la prophylaxie animale du paludisme. [**Principles and Possibilities of Animal Prophylaxis of Malaria.**]—*Arch. Inst. Pasteur de Tunis.* 1937. Dec. Vol. 26. No. 4. pp. 625–664. [10 refs.]

The author substantiates his claim to have been the first to determine the important rôle played by domestic animals, by the zoophilic adaptation of anopheles, in causing the spontaneous disappearance of malaria, from certain parts of Europe in particular. In describing how this zoophilic deviation of Anopheles has come about, the discovery of the different races of *A. maculipennis*, and the extent to which the zoophilic adaptation of certain of these races explains the commonly observed phenomenon of anophelism without malaria, the author traverses familiar ground but his dissertation is interesting and informative. If animals are to afford effective protection they must be kept permanently, during the night, in stables in close proximity to the dwellings of the human beings they are to protect. The protection is likely to fail if for any cause anopheline breeding places are much increased in number or area ; this is what is meant when the importance of stabilization of hydrological conditions is stressed. Improvement in housing conditions and social progress favour the development of zoophilic deviation of Anopheles. These and other considerations lead the author to consider to what degree and in what circumstances such zoophilic deviation might eventually contribute to the reduction of malaria in North Africa, where varieties of *A. maculipennis* are also important vectors. This cannot in any case be brought about suddenly, by the mere erection of stables in the vicinity of dwellings. This deviation is a vast biological phenomenon and the first necessity would seem to be a general transformation in conditions of human life.

The second part of the paper deals with anophelism without malaria and animal deviation of anophelines in the Far East, notably in French Indo-China. Reference is made to the work of TOUMANOFF, BOREL, MORIN, GASCHEN, TREILLARD and others, which has been duly noted from time to time in this *Bulletin.* *N. W.*

CHOPRA (R. N.) & BASU (B. C.). **A Preliminary Report on the Effect of Anti-Malarial Drugs upon the Infectivity of the Patients to the Mosquitoes.**—*Indian Jl. Med. Res.* 1937. Oct. Vol. 25. No. 2. pp. 459–464. [13 refs.]

This is a record of experiments carried out in Calcutta to determine the effect of varying doses of anti-malarial drugs on the infectivity of gametocyte carriers for mosquitos. Laboratory-bred *A. stephensi*, 4,665 in number, were used. The drugs tested were cinchona febrifuge, quinine sulphate, malarcan, tebetren, atebrin, plasmoquine and gametochin. All these drugs with the exception of plasmoquine failed to prevent the development of crescents in *A. stephensi*. Plasmoquine in doses of 0·02 gm. was effective in preventing such development. Atebrin and malarcan prevented the development of gametocytes of *P. malariae* in *A. stephensi*: tebetren failed to do so. Plasmoquine alone in doses of 0·02 gm., in *vivax* infections, failed to prevent the formation of oöcysts; a small dose of quinine was sufficient to arrest such development. *N. W.*

MISSIROLI (A.). Sullo sviluppo dei parassiti malarici. 4a nota. [**The Development of the Malaria Parasite.**]—*Riv. di Parassit.* Rome. 1938. Jan. Vol. 2. No. 1. pp. 39–43. With 2 figs. English summary (4 lines).

This is an interesting record of observations made on the sporozoites of *Plasmodium praecox* (*relictum*) injected into canaries, from which the author concludes that so-called sporozoites are in reality immature sporocysts which continue their development in the lymph spaces of the canary, each giving rise to a number of sporozoites, not exceeding eight. *N. W.*

TOUMANOFF (C.). Persistance des sporozoites du paludisme chez *A. minimus* après plusieurs prises de sang sur les animaux. [**Persistence of Malaria Sporozoites in *A. minimus* after Several Feeds on Animals.**]—*Bull. Soc. Path. Exot.* 1937. Nov. 10. Vol. 30. No. 9. pp. 765–767.

In a plantation in Cambodia, in which there are no domestic animals, a large proportion of *A. minimus* were found to be naturally infected. One such mosquito, engorged with human blood, was brought to the laboratory and during the next twenty days was fed five times on a buffalo. Five days later the insect was dissected: 19 cysts of *falciparum* type were found on the stomach and very numerous sporozoites, of normal appearance, were found in the salivary glands. Another *minimus* also infected naturally was fed on an animal ten times during the space of 18 days, at the end of which it still had very numerous sporozoites in the salivary glands. *N. W.*

GENTZKOW (Cleon J.). **A Method for the Determination of Atabrine in the Blood.**—*Amer. Jl. Trop. Med.* 1938. Mar. Vol. 18. No. 2. pp. 149–156. [15 refs.]

The author points out that a study of the rate of absorption, storage in tissues, destruction in the organism, as well as rate and mode of excretion of a drug is essential in chemotherapeutic studies. In malaria the concentration in the blood is of importance. He has made

estimations of the atebrin content of the blood of patients receiving treatment, to see if any relation existed between such content and clinical cure. Methods described earlier in the literature are reviewed, and consist of extractions by an immiscible solvent followed by colour or nephelometric comparisons with standard solutions. The new method consists essentially in the precipitation of blood proteins and simultaneous extraction of the atebrin in acetone. The atebrin so isolated is precipitated by a modified Tanret's reagent and measured nephelometrically. The greatest concentration of atebrin dealt with in the blood was never above 0·004 mgm. per cc. Dog, horse, mule and human blood have been used.

Five cc. of oxalated blood is added to 45 cc. of acetone, shaken and mixed with 2 cc. of a 20 per cent. solution of neutral lead acetate. The whole is then centrifuged and the clear supernatant fluid evaporated to 2 cc. after addition of 5 cc. of water. 0·5 cc. of 30 per cent. phosphoric acid is then added and the volume made up to 5 cc., after which the solution is filtered and the volume noted. 0·1 cc. of a modified Tanret reagent is added per cc. of filtrate, followed by heating on the water bath at boiling point for 5 minutes. On cooling, a fine precipitate is produced which remains suspended for some time. A simple photo-electric colorimeter has been employed for estimation after calibration with known standards. The log concentration of atebrin is directly proportional to the log of the output of the photo-electric cell in microamperes. The human visual factor is thus eliminated. It is claimed that all atebrin is extracted by the above procedure and that differences of 0·1 mgm. atebrin per litre can be measured. The reaction is not specific as plasmoquine, quinine and other alkaloids interfere if present. *J. D. Fulton.*

CHOPRA (R. N.) & ROY (A. C.). **On the Estimation of Atebrin in Tissues.**—*Indian Jl. Med. Res.* 1937. Oct. Vol. 25. No. 2. pp. 455–458.

The method employed by the authors consists essentially in digesting the protein material of the tissue with papain, extracting the atebrin with dilute hydrochloric acid and comparing the acid extract, in a colorimeter, with a standard solution of atebrin. The method is fairly simple and, according to the authors, does not admit of an error of more than from 15 to 20 per cent. Full details of the technique are given as follows :—

"The weighed tissue is minced, taken in an Erlenmeyer's flask of suitable capacity and a small amount of papain (powder), 0·2 g. to 1 g. depending upon the weight of the tissue, is sprinkled over it and well mixed. It is then kept in this condition for 10 to 15 minutes with frequent mixing of the materials. Approximately N-10 HCl is then added (5 cc. of the acid for 1 gramme of the tissue) and the contents of the flask were mixed and put in a water-bath maintained at 60°C. for 1 hour or more if the tissues are not completely digested and stirred from time to time. Muscles are more or less completely digested by this procedure but some of the organs such as liver, lung, etc., which contain considerable amount of fat, appeared to be comparatively unaffected. What appeared to be undigested residue, however, could be easily reduced to a fine pulp by means of a glass-rod, which formed a fine sediment at the bottom which can be easily washed to remove atebrin. It is then centrifuged, the clear supernatant fluid is transferred to a separating funnel and the residue washed 2 or 3 times with a suitable amount of N-10 HCl. After centrifuging each time the clear fluid is transferred to the funnel. It is then

alkalized with 60 per cent. KOH and the mixture thoroughly shaken with 20 cc. to 30 cc. of ether (depending upon the volume of the extract). It sometimes happens that there is not a clear separation in two layers and a gelatinous intermediate layer is formed which demixed only very slowly. In such a case the clear aqueous solution is drained and 4 cc. to 5 cc. of 96 per cent. alcohol are added into the funnel. The whole is again thoroughly mixed and the mixture is now clearly separated in two distinct layers. Now the mixture is again separated and the ether collected apart and the remainder of the solution is again shaken with 20 cc. to 30 cc. of ether. The extraction of atebrin is usually complete at this stage. The united ether extracts are twice washed with 20 cc. to 30 cc. of water. Any coloration of the wash-water, if there be any, has nothing to do with atebrin. The ether extract is then shaken with two successive 10 cc.-lots of N-10 HCl, whereby the ether becomes entirely colourless. The acid extract is made up to a convenient volume with N-10 HCl, depending on the atebrin content, and compared in a colorimeter against a standard solution of atebrin. A 0·01 per cent. solution of atebrin in N-10 HCl serves as a stock standard and it may be conveniently diluted to match the colour of the unknown."

N. W.

Galvão (A. A.) & Lane (J.). Notas sobre os nyssorhynchus de S. Paulo. IV. Sobre a infecção experimental do *Anopheles albitarsis* e *A. strodei* da cidade de São Paulo, pelo *Plasmodium vivax*. [**Experimental Infection of** *A. albitarsis* **and** *A. strodei* **by** *Plasmodium vivax* **in the Town of São Paulo.**]—Reprinted from *Folia Clin. et Biol.* S. Paulo. 1937. No. 3. pp. 65–69. With 3 figs. [10 refs.]

Clark (Herbert C.). Recent Research on Prophylaxis and Treatment of Malaria.—*Southern Med. Jl.* 1937. Aug. Vol. 30. No. 8. pp. 850–853. [26 refs.]

Komp (W. H. W.). **The Species of the Subgenus Kerteszia of Anopheles (Diptera, Culicidae).**—Reprinted from *Ann. Entom. Soc. America.* 1937. Sept. Vol. 30. No. 3. pp. 492–524. With 14 figs. on 3 plates. [30 refs.]

All the members of the subgenus *Kerteszia* of Anopheles breed in water in bromeliads and more rarely in bamboo. This paper is a careful systematic study of the group, the recognized species being increased from 3 to 7. One of these species *Anopheles bellator* occurs in immense numbers in Trinidad, breeding in the bromeliads which grow on the shade trees planted on the cocoa estates. *A. bellator* swarms in houses and bites man very readily and there is good epidemiological evidence that this species is the malaria carrier on these estates.

V. B. Wigglesworth.

Roubaud (E.), Colas-Belcour (J.) & Treillard (M.). Hybridation naturelle de deux biotypes considérés comme amixiques de l'*Anopheles maculipennis* (var. *typicus* et *atroparvus*). [**Hybridization in Nature between Two Races of** *A. maculipennis* : *typicus* **and** *atroparvus*.]—*Bull. Soc. Path. Exot.* 1937. July 7. Vol. 30. No. 7. pp. 577–580. With 4 figs.

Females of *A. maculipennis* caught in Normandy laid eggs of the form characteristic of var. *typicus* ; but in the next generation some of the females laid infertile eggs of *typicus* form, some fertile eggs of

atroparvus form and some intermediate between these two. As there was no possibility of mating with *atroparvus* having occurred in the laboratory, this result is interpreted as showing that crossing had taken place in nature between the two races ; races hitherto supposed to be incapable of mixing. *V. B. Wigglesworth.*

ENIKOLOPOV (S. K.). Au sujet de l'écologie des *Anopheles algeriensis* Theo. [**Ecology of** *A. algeriensis* **Theo.**]—*Med. Parasit. & Parasitic Dis.* Moscow. 1937. Vol. 6. No. 3. [In Russian pp. 354–358. With 2 figs. French summary p. 359.]

A. algeriensis was found breeding in large numbers in the vast swamps that are formed by springs along the edge of the delta of the Sulak River which flows into the Caspian Sea. The larvae were found in the dense shade of reeds. The water in summer has a temperature of from 9 to 10°C. Even in winter when the atmospheric temperature falls to 11°C. below zero the temperature of this water is as high as 4°C. Swarms of these insects attack men and animals at sunset : many are flying also before dawn. During the day they only attack in places where the shade is very dense. Many wild animals are found in the locality, wild boars, deer, jackals, etc. Numerous female *A. algeriensis* use the habitations in the vicinity of the swamps as daylight resting places but none are to be found in the nearest villages which are from 3 to 5 kilometres away. Adult mosquitoes first appear at the end of April or the beginning of May : in autumn they are very numerous up to the beginning of December. *A. algeriensis* appears to play a very insignificant rôle in the transmission of malaria : labourers living close to these marshes suffer very little from malaria, whereas the inhabitants of neighbouring villages, in which *A. maculipennis* is abundant, suffer greatly. *N. W.*

YAMADA (Manabu). **A New Species of** *Anopheles* **in Chosen (Korea).**—*Keijo Jl. of Med.* 1937. Oct. 20. Vol. 8. No. 3. pp. 237–255. With 5 plates. [47 refs.]

The species is named *Anopheles pullus* and is fully described as egg, larva and adult. It belongs to the subgenus *Anopheles*, resembling *A. hyrcanus*, *barbirostris*, etc. It bites man vigorously in houses, but its relation with malaria transmission is not known.

V. B. Wigglesworth.

GALVÃO (A. A.), LANE (J.) & CORRÊA (R.). Notas sobre os Nyssorhynchus de S. Paulo. V. Sobre os *Nyssorhynchus* de Novo Oriente. [**On the Anopheles (Nyssorhynchus) of São Paulo.**]—Reprinted from *Rev. Biol. e. Hyg.* 1937. Aug. Vol. 8. No. 1. pp. 37–45. With 5 figs. on 2 plates. English summary.

" During an investigation in Novo Oriente, State of São Paulo, Brazil, the authors collected *Anopheles* (*Nyssorhynchus*) *arbitarsis*, *argyritarsis*, *tarsimaculatus*, *strodei* and *bachmani* and the following results are given :—1) *Anopheles* (*Nyssorhynchus*) *darlingi* showed morphological differences in adults male terminalia and egg which is figured and described. These differences were to such an extent that a variety was created and named *Anopheles* (*Nyssorhynchus*) *darlingi* Root 1926 var. *paulistensis* n. var. Specimens from other localities (São Paulo ; Porto S. Pedro, Piracicaba ; Amazonas, Manáus ; and Baía) appeared to belong, as far as adult characters are

concerned, to this variety. Comments are made regarding this variety and the typical form described by Root. 2) *Anopheles* (*Nyssorhynchus*) *tarsimaculatus* proved to belong to a different variety and the findings are briefly stated as a more complete account is being published elsewhere. 3) *Anopheles* (*Nyssorhynchus*) *bachmani* specimens conform to descriptions for this species and the eggs are described and figured for the first time. 4) *Anopheles* (*Nyssorhynchus strodei* and *albitarsis* are commented on. *Anopheles strodei* from the city of São Paulo differs from the Novo Oriente specimens to some extent. 5) Adult captures inside houses were made during February 1937, March 1936 and April 1937, *i.e.*, during the malaria season. The percentage of *Anopheles* (*Nyssorhynchus*) *darlingi* was from 79·7 per cent. up to 100 per cent.

"The authors believe that *Anopheles darlingi* is to be considered as the most dangerous vector in this locality."

CORRADETTI (Augusto). Sulla composizione della fauna anofelica in relazione ai diversi gradi di bonifica nella valle del Lemene (Veneto). [**Anopheline Fauna in Relation to Different Stages of Bonification.**]—*Riv. di Malariologia.* Sez. I. 1937. Vol. 16. No. 4. pp. 265–275. With 1 folding plate. English summary (6 lines).

In a small tract of land, 20 kilometres long and 1 kilometre broad, in the Lemene Valley, between Caorle on the Adriatic and the Venice-Trieste Railway Line, are to be found almost all conditions from salt marshes to areas in which agricultural bonification is complete. Here a study of the anopheline fauna was carried out. Adults were collected from 65 catching stations and larvae were sought for systematically. Larvae were not numerous owing to the large number of Gambusia in most of the collections of water. *A. elutus*, the malaria vector of the region, was found in abundance where bonification had either not been, or had only imperfectly been, carried out, and its prevalence diminished in direct proportion to the progress achieved in bonification. *A. maculipennis* var. *typicus* and *messeae* were found everywhere, though *messeae* was not very abundant. *N. W.*

KALANDADZE (L. P.) & LEMER (M.). Sur l'emploi du chloropicrine contre les larves des moustiques. [**Chloropicrin as a Larvicide.**]—*Med. Parasitol.* Moscow. 1936. Vol. 5. No. 4. pp. 568–578. [In Russian.] [Summarized in *Rev. Applied Entom.* Ser. B. 1937. June. Vol. 25. Pt. 6. p. 144.]

"Field and laboratory tests of the value of chloropicrin against mosquito larvae and pupae were carried out in August–October 1933 and 1934 in the environs of Tiflis. When placed in a receptacle at the bottom of the water, it was effective in the laboratory, but not in the field. On the other hand, when sprayed at the rate of 0·05, 0·1 or 0·3 gm. per litre, it killed all the larvae and pupae, and the water remained free from infestation for 4–5 days when the rate was 0·05 gm. and for 7–10 days when it was 0·1 or 0·3 gm. Complete mortality of larvae and pupae was also obtained in all tests by broadcasting sawdust moistened with chloropicrin; when the rates of application were 0·1 and 0·3 gm. per litre, the toxic action lasted 5–6 and 10–12 days, respectively. The authors believe that chloropicrin acts on the larvae and pupae as a contact poison, as it practically does not dissolve in water when submerged, its toxic effect ceases in about 5–10 days after surface application, and it was not effective when tested as a

stomach poison in a mixture of flour, road dust and kerosene. Politov stated that it is soluble in water to the extent of 10·65 gm. per litre at 18°C., but according to the literature, the figure should have been 1·65 gm. It killed some aquatic plants and animals, including *Gambusia* ; but a dog and ducks were not affected by drinking treated water. Estimates are given of the costs of treating a large area of shallow water with chloropicrin, various oils and Paris green ; the cost for chloropicrin is far the highest."

MISHNAEVSKY (M. N.) [Edited by]. **The Malarial Mosquito and the Measures for combating it.**

This book was reviewed in this *Bulletin*, 1937, Vol. 34, p. 738.

BOHLS (S. W.) & LAWRENCE (D. H.). **Two Years' Observation of Malaria Therapy in Texas.**—*Amer. Jl. Trop. Med.* 1938. Jan. Vol. 18. No. 1. pp. 101–110.

This paper describes the experience of the Texas State Department of Health with malaria therapy of dementia paralytica. Previous to 1935 attempts at conserving a strain of *Pl. vivax* by blood transfers had been unsuccessful. Since then infection has been transmitted by a laboratory-bred strain of *Anopheles quadrimaculatus*, Boyd's McCoy strain of *Pl. vivax* being used, and the early difficulties have been overcome. The administration of such anti-syphilitic drugs as neosalvarsan a few days before inoculation with malaria militates against successful infection. Between 1927 and 1936 fifty-three sufferers from dementia paralytica in the Austin State Hospital received no malaria therapy ; 47 of them are now dead, nearly all of them dying within two years of admission. Between November 1934 and November 1936, sixty-eight unselected patients received malaria therapy ; of this group only seven are dead. Good results are obtained in preparetic cases. If in the anaemia occasioned by the malaria the haemoglobin falls below 60 per cent., liver concentrate given intramuscularly has proved useful. Under careful supervision the malaria fever can be allowed to terminate spontaneously. Very few relapses occur ; if they do they terminate spontaneously after few paroxysms. Serological changes are slow but definite. Repeated tests are necessary to note progressive changes in spinal fluid. Over a two-year period 68 patients were treated ; of these 76 per cent. showed satisfactory improvement. *N. W.*

GOLDEN (L. A.). **The Rôle of Malaria in General Paresis.**—*New Orleans Med. & Surg. Jl.* 1937. June. Vol. 89. No. 12. pp. 694–697.

The author states that there are very few records as to the frequency of spontaneous remission in general paresis. The four reliable statements he was able to find gave spontaneous remission rates varying from 3·5 to 11 per cent. In cases treated by induced malaria authors have published remission rates varying from 25 and 68 per cent. The striking improvement brought about by this form of treatment endows with interest any inquiry into the manner in which malaria produces such good results.

A description is given of the histopathological changes found in a typical case of general paresis untreated by malaria. This is followed by an account of the histopathology of cases that have died during or

after malaria therapy as described in the literature. From this the author concludes that the primary effect of malaria is to destroy the spirochaete. The presence of large numbers of dead spirochaetes increases the inflammatory reaction, and the microglia are increased. With the removal of the dead spirochaetes by the microglia the latter all but disappear as does the inflammatory reaction. The damage done to the ectodermal tissue, the nerve cells, is, however, not repaired. No explanation is forthcoming as to why the spirochaete, in successfully treated cases of general paresis, becomes more active in parts of the body other than the central nervous system. The practical lesson emerging from this study is the importance of submitting patients to malaria therapy as early as possible in the course of the disease.

N. W.

Boyd (Mark F.) & Kitchen (S. F.). **Observations on Induced Falciparum Malaria.**—*Amer. Jl. Trop. Med.* 1937. Mar. Vol. 17. No. 2. pp. 213–235.

The appreciable degree of immunity to *vivax* infections possessed by the negro population determined the use of *Pl. falciparum* in the malaria therapy of neurosyphilis in negro patients in the Florida State Hospital. This species has been relatively seldom used for malaria therapy, a fact that endows the carefully recorded observations of this paper with special interest. Eighty patients were inoculated, infected mosquitoes being used, of which 60 were successfully infected. The results of treatment of these patients, as regards neurosyphilis, were as satisfactory as those usually obtained with *vivax* infections.

Successful infection was not dependent upon the number of infected mosquitoes employed. In the absence of homologous immunity one infected mosquito is enough to provide an infecting dose. Patients infected from October to December exhibited shorter incubation periods, longer attacks and fewer instances of renewed activity after the cessation of the primary attack. Infections during the winter had long incubations, shortest attacks and greatest liability to renewed activity. Parasites are usually detectable in the blood before the onset of symptoms. The minimal period between infection and the detection of parasites in the peripheral blood was six days. The longest period observed was 25 days. The most common period was from 11 to 13 days. The clinical onset was most common on the twelfth day. Fever may be remittent or intermittent, most commonly the latter and of the tertian type. Remittent fever occurs at the onset and may last for a week or more; it indicates great susceptibility of the patient and great invasiveness on the part of the parasite. Infections must be closely watched. Safe limits are temperatures not exceeding 104° to 105° F., especially if intermittent, and parasite counts not exceeding 100,000 per cubic millimetre. If these be exceeded quinine is indicated, 5 or 10 grains repeated after an hour if the effect on the temperature is not apparent. Primary *falciparum* attacks are shorter than primary *vivax* attacks. The mean duration was 10·8 days, the maximum 36 days. Recurrences were observed in 58 per cent. of cases, nearly all being observed within eight weeks of the termination of the primary attack. Thorough intensive quininization after the primary attack makes recurrences unlikely.

N. W.

FONG (Theodore C. C.). **A Study of the Mortality Rate and Complications following Therapeutic Malaria.**—*Southern Med. Jl.* 1937. Nov. Vol. 30. No. 11. pp. 1084–1088. [28 refs.]

This is an important contribution to the literature of the dangers attendant upon malaria therapy, dangers which, in the opinion of the author, are outweighed by the benefits conferred. It contains the records of 1,012 cases successfully inoculated with either tertian or quartan malaria, between 1922 and 1936. Of these cases 34 died, all within a month of the completion of treatment, a death-rate of 3·35 per cent. Of the 34 fatal cases 17 were examined post mortem. Death in 7 of these was ascribed to myocardial failure ; in 8 to acute malaria ; in 1 to pulmonary thrombosis ; and in 1 to tuberculous bronchopneumonia. In this last case malaria activated a quiescent pulmonary tuberculosis. Of the 17 cases which were not examined post mortem myocardial degeneration was responsible for death in 7, nephritis in 2, pulmonary disease, including bronchopneumonia and an activated case of pulmonary tuberculosis, in 7, and acute malaria in 3. Two of the acute malaria deaths were due to rupture of the spleen. Among other post-mortem findings in cases dead of acute malaria were adenocarcinoma of the pancreas, haemolytic jaundice and streptococcic septicaemia, *falciparum* malaria and pulmonary collapse. There were 3 deaths after the initial malaria paroxysm, 2 after the second, 3 after the third, 3 after the fourth, 2 after the fifth, 7 after the sixth, 2 after the seventh, 4 after the eighth, 3 after the tenth, 1 after the eleventh, 2 after the twelfth, 1 after the thirteenth and 1 after the fourteenth.

Mild complications were sometimes met with in therapeutic malaria, headache, dizziness, vomiting, nose-bleeding and slight intestinal disturbance. Only 15 cases of jaundice occurred in this series of 1,012 cases : most of these were seen in quartan infections. All but one were of the catarrhal type. Six cases of jaundice occurred among the non-syphilitic malarial donors.

Of the two deaths from rupture of the spleen one occurred after two paroxysms, the other after eleven. These two spleens weighed 660 and 540 grammes respectively. In therapeutic malaria there is very rarely any palpable increase in the size of the spleen.

In malaria therapy the disappearance of paretic manifestations is commonly followed by symptoms of schizophrenia : hallucinatory, hypochondriac, manic depressive, and catatonic forms occur. These post-malarial psychoses are of unfavourable prognostic significance.

Gummata rarely occur in untreated general paresis ; after malaria therapy their appearance is not uncommon. In two cases of the present series gummata developed in the lungs.

In one case an acute thyroiditis followed malarial treatment.

The paper contains a review of the literature of the more uncommon types of complications occurring in induced malaria. The series of cases reported shows that the more serious complications are relatively rare. *N. W.*

AMOEBIASIS AND DYSENTERY.

DENNIS (E. W.) & LUND (E. E.). **Studies on the Intestinal Protozoa of Man in Syria and Lebanon. I. The Incidence of Intestinal Protozoa in Hospital Patients at Beirut.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1937. Jan. 26. Vol. 30. No. 4. pp. 407–422. With 3 graphs. [12 refs.]

The paper gives an account of an intestinal protozoal survey carried out amongst 4,234 patients at the hospital and clinic of the American University of Beirut. Of these 42·5 per cent. were positive for one or more of the protozoa, while 8·43 per cent. were infected with *E. histolytica*. Amoebic dysentery is an important disease in Beirut and the adjoining country and it accounts for about 10 per cent. of all the dysentery cases. There was an increased incidence of amoebiasis during 1932–1933 and 1933–1934. This appears to be accounted for by the dryness of the two winters, which preserved the house flies which at ordinary times are destroyed by the heavy rains. *C. M. Wenyon.*

FISCHER (Walther). Ueber Amöbiasis in Deutschland. [**Amoebic Infection in Germany.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1938. Apr. Vol. 42. No. 4. pp. 161–167. With 2 figs.

The possibility of the occurrence of indigenous amoebic dysentery in Germany which may give rise to severe, and possibly fatal, developments is discussed in this paper. A fatal case of liver abscess is reported in a man of 55 years of age, a ship's engineer, at Rostock, in November 1937. No positive diagnosis had been made prior to death, though a tumour of the liver or gall-bladder had been mooted. On opening the abdomen half a litre of serous fluid escaped and each pleural cavity contained an effusion of 300 cc. The spleen was much enlarged (300 gm.) with perisplenitis and adhesions. The base of the right lung was compressed, a small hypernephroma was found in the right kidney. Typical amoebic ulceration of the whole large intestine, and apparently also of the lower ileum, was present. The liver itself was enormous, weighing 8·3 kgm., on incision 5–9 litres of chocolate-coloured pus escaped. The whole of the right lobe was occupied by an enormous abscess measuring 27 × 27 × 17 cm. The diagnosis was made absolute by the demonstration of vegetative amoebae in smear preparations from the walls of the abscess and in sections of the intestinal lesions.

Apparently the patient had been at work till fourteen days before his fatal illness and then had noticed the enlargement of the liver which had become painful. There had been no diarrhoea or other intestinal symptoms. A complete blood count had been carried out: —a leucocytosis of 21,400 and a secondary anaemia had been thereby revealed.

[There appears to be no indisputable proof for the contention that this *histolytica* infection was in the first instance contracted in Germany. It was known that the patient had been in the tropics up to 1914 and in 1908 he had suffered from malaria and up to 1934 he had been in the Mediterranean. As Fischer remarks, the latent period between the original amoebic infection and the development of metastases may be very short, or as long as 30 years—or even longer in the reviewer's experience. On the other hand there are authentic records of acute

amoebic dysentery being contracted in Germany—and the reviewer has recorded three such instances in War pensioners who had acquired their infections primarily in prison camps in Germany during the War. Quite recently he has seen a case with a particularly heavy infection of *E. histolytica* cysts from Vienna.] *P. H. Manson-Bahr.*

TRIBEDI (B. P.) & DE (M. N.). **Observations on the Dysenteric Conditions among Europeans of Calcutta.**—*Brit. Med. Jl.* 1938. May 7. pp. 1000–1003. With 1 chart. [11 refs.]

Dysentery is a very important cause of sickness among the general European community in India. Amoebic infection is frequently encountered in specimens where the physician has hardly any suspicion of it and in which the appearance of the stool is not suggestive of such infection. Sometimes it is accompanied by symptoms of dyspepsia, vague unaccountable abdominal pain, liquid stools without obvious cause, painful enlarged liver, low-grade pyrexia and loss of weight. In some cases *E. histolytica* could be found at any time during the course of seven years, and these parasites have been seen on many occasions in specimens which could easily have been passed as well-formed and innocent-looking, the amoebae would be discovered in small shreds of mucus adhering to the surface. Particular emphasis is laid upon the injurious effect of a low temperature on the vitality of the amoebae.

The Europeans in Calcutta exist as a semi-isolated community living apart from the general mass of the population under the best hygienic conditions. Hence the frequency of dysenteric conditions amongst them is a matter of surprise. The results of seven years investigation are tabulated in the paper and include analyses of 1,370 specimens of faeces. Although amongst the Indian population there is a definite seasonal correlation between the two main forms of the disease—amoebic and bacillary, this was not found to be the case in the European population.

From the curative point of view both amoebic and chronic bacillary infection are extremely hard to deal with. The source of infection is also difficult to ascertain and the conclusion is arrived at that green unboiled vegetables which are insufficiently sterilized by immersion in dilute potassium permanganate solution is the most likely. Bacillary infection, especially of the Flexner type, is common, but *Ps. pyocanea*, *Bact. morgani*, *Bact. carolinum* and *Bact. faecalis alcaligenes* have also been encountered and give rise to intestinal disorder.

No definite association between the presence of Charcot-Leyden crystals and amoebiasis could be ascertained. *P. H. M.-B.*

CANAVAN (W. P. N.) & HEFLEY (H. M.). **Investigation of Intestinal Parasitic Infections of a Selected Population of Oklahoma City.**—*Amer. Jl. Trop. Med.* 1937. May. Vol. 17. No. 3. pp. 363–383. With 1 fig. [32 refs.]

The examination of a single faecal specimen from 953 individuals connected with the University of Oklahoma Medical School and Hospital gave an infection rate for *E. histolytica* of 6·8 per cent. From the figures obtained it would appear that infections with this amoeba are as common in Oklahoma as in other parts of the country.

C. M. W.

HARDY (A. V.). **The Influence of Variations in Exposure in Amebiasis. A Quantitative Study.**—*Amer. Jl. Hyg.* 1937. May. Vol. 25. No. 3. pp. 421–429. [Summary appears also in *Bulletin of Hygiene.*]

In addition to the amoebic infections which resulted in 1933 from the exposure of employees and guests in two Chicago hotels to polluted water, there occurred in 1934 a similar series of infections amongst firemen and onlookers at the stockyards fire, in which the pumped water, found afterwards to be polluted, was used for purposes of quenching thirst. Analysis shows that of 300 firemen who worked at the fire, 124 acquired amoebic infection from the water during the few hours of possible exposure. Similar calculations applied to onlookers show that of 7,500 about 3,100 became infected. In the onlooker group there were only six cases of actual amoebic dysentery and none in the fireman group. These results are contrasted with the infections in the hotels which resulted from exposure over longer periods. The number of amoebic infections which occurred was similar to that in the fire group of exposed individuals but the number of cases of dysentery was greater. Furthermore, the incidence of dysentery cases amongst the hotel people was found to vary directly with the duration of exposure. It is thus seen that the long and repeated exposures at the hotels did not lead to more infections than the short exposure at the fire, but they did lead to a greater incidence of actual amoebic dysentery.

C. M. W.

BRENNER (Charles). **Endemic Amebic Dysentery in New England.**—*New England Jl. of Med.* 1937. Nov. 25. Vol. 217. No. 22. pp. 859–861.

The author describes three cases of amoebic dysentery which have been observed by him during the past 18 months. One was a man of 61 years who had lived in Boston for more than twenty years and his symptoms, diarrhoea with passage of blood and mucus, had been present for a year. The second was a man of 43 years, born in Boston and never been out of New England ; he had a history of diarrhoea recurring at irregular intervals for twelve years. The third was a woman of 30 years, born in and never left Boston, with a history of two years' diarrhoea. In all three *E. histolytica* were abundant in the stools and all cleared up readily on emetine hydrochloride and carbarsone and though watched for some time—up to a year—had had no recurrence.

The author then reviewed the hospital records since 1913 and found another twelve cases. Of the fifteen five had never been beyond New England, New York, Pennsylvania and New Brunswick. Of the rest, two were infected in China, and one each in Ceylon, Colombia, Greece, Holland, Mesopotamia, Porto Rico, Texas, and Virginia.

CRAIG in 1936 estimated that 8–10 per cent. of the population of the United States were infested with *E. histolytica* or its cysts, and SHATTUCK found 2 per cent. of stools of unselected patients in hospital were carriers of the parasite. It is important, therefore, to establish the diagnosis early to prevent spread of infection and it is noted that judging from the above records therapy on the usual lines is rapidly effective.

H. H. S.

DESCHIENS (R.). Rôle de la flore microbienne associée à l'amibe dysentérique dans l'étiologie de l'amibiase expérimentale. [**Rôle of the Intestinal Flora in inducing Experimental Amoebiasis.**]—*C. R. Soc. Biol.* 1937. Vol. 125. No. 23. pp. 1017–1020.

The paper describes experiments designed to test the effect of inoculating cats with cultures of *E. histolytica* together with cultures of *Bact. coli*. The inoculations were made into the lower end of the small intestine by means of laparotomy. Three series of cats were used, the first receiving amoebae culture together with *Bact. coli*, the second the amoebae culture alone and the third only *Bact. coli*. It was noted that in the first series there was a much higher rate of amoebic infection than in the second series, while in the third series there were naturally no cases of amoebic infection but the large intestine in the majority of the animals revealed haemorrhagic areas and other signs of intestinal irritation. The action of *Bact. coli* would appear to be responsible for the high amoebic infection rate in the first series. *C. M. W.*

KELLOGG (Wilfred H.) & SCOTT (Elizabeth A.). **The Laboratory Diagnosis of Amebiasis.**—*Amer. Jl. Public Health.* 1937. Aug. Vol. 27. No. 8. pp. 813–816.

This article has been written as a warning to those who are inclined to diagnose the presence of *Entamoeba histolytica* without having had sufficient experience in this particular kind of investigation. It has been stimulated, doubtless, by the recent popularity of amoebic infections in the United States and mentions a number of instances where serious and inexcusable mistakes have been made. The examination of fixed films stained by the iron haematoxylin method is considered the most reliable procedure, but even this will not compensate for a lack of experience and a failure to comprehend the difficulties and pitfalls which confront those who plunge dogmatically and without justification into this type of work. *C. M. W.*

REICHENOW (Eduard). Die Biologie der *Entamoeba histolytica* als Grundlage für die Pathogenese. [**The Biology of** *E. histolytica* **and its Pathogenicity.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1937. Feb. Vol. 41. No. 2. pp. 257–262.

In this article the author states his view regarding the pathogenicity of *E. histolytica*. He holds that this amoeba, like all the other intestinal amoebae, is normally an inhabitant of the lumen of the intestinal tract and not a tissue invader. Under certain conditions, which occur especially in the tropics, these amoebae invade the intestinal wall and give rise to amoebic dysentery. The large tissue-invading forms of the amoeba have no part in the normal life-history of the organism, though they are capable of multiplying in the invaded tissues. The normal form is the so-called "minuta" form which lives in the intestinal lumen, where it reproduces by binary fission and produces the characteristic cysts. This view gives a reasonable explanation of the known facts regarding healthy carriers, which are far more numerous than the cases with dysenteric symptoms. The author has estimated that such a healthy carrier may pass as many as thirty million cysts a day, which must indicate the presence in the intestine of a much greater number of amoebae. It seems

highly improbable that this number of amoebae would be in the wall of the intestine without giving rise to symptoms. Such a carrier, when he goes to the tropics, may rapidly go down with amoebic dysentery, owing to some change resulting from the climate and not from reinfection with another strain of amoebae. The view also does away with the necessity of assuming that there exists a non-pathogenic amoeba, *E. dispar*, as distinct from a pathogenic one, *E. histolytica*. *C. M. W.*

POINDEXTER (Hildrus A.). **Some Observations on the Effects of Environmental Changes on the Biology of** *Endamoeba histolytica*.—*Puerto Rico Jl. of Public Health & Trop. Med.* 1937. Mar. Vol. 12. No. 3. pp. 314–323. [22 refs.] [Spanish version pp. 324–335.]

By experiments on cats and dogs it was determined that culture amoebae containing much starch were less infective than amoebae from cultures without starch. The starch-containing amoebae are sluggish and less inclined to tissue invasion than the others. Animals fed on a diet rich in carbohydrate were less susceptible to amoebic infection than animals on a protein-rich diet. It was shown that cysts from dogs differed from those from human carriers in being more easily killed by external agencies. These cysts, unlike those from human cases, failed to produce infection when given to animals by the mouth. Similar delicate cysts can be obtained by rendering culture media less favourable to growth. It is concluded that the apparent resistance of the Porto Rican to amoebic infection is due in some degree to the rich carbohydrate diet. *C. M. W.*

YAMAMOTO (Yoshio). **Amoebic Dysentery. V. Cultivation of** *Endamoeba histolytica*. **Third Report. Influence of Various Substances on the Growth of Dysenteric Amoeba.**—*Jl. Oriental Med.* 1937. May. Vol. 26. No. 5. [In Japanese pp. 937–968. [57 refs.] English summary p. 81.]

The author has tested a number of media for the growth of *E. histolytica* and finds that those of Dobell and Laidlaw and of Tanabe and Chiba are the best. The addition of Vitamin B improves the growth, as also do ovahormone, haemoglobin, and red blood corpuscles of the horse. *C. M. W.*

STONE (William S.). **The Resistance of** *Endamoeba histolytica* **Cysts to Chlorine in Aqueous Solutions.**—*Amer. Jl. Trop. Med.* 1937. July. Vol. 17. No. 4. pp. 539–551.

The author has tested the action of chlorine in water on the cysts of *E. histolytica*. The viability or otherwise of the cysts has been determined by direct observation of the cysts, the eosin test and cultivation. Furthermore, the viability of accompanying *Bact. coli* was also controlled. Recognizing that varying amounts of chlorine were fixed by the actual culture materials, the residual free chlorine after mixture with the cyst suspension was taken into account. It was found as a result of these experiments that the cysts of *E. histolytica* were no more resistant to free chlorine than is *Bact. coli*. *C. M. W.*

IVANIĆ (Momčilo). Ueber die in den Epithelzellen des menschlichen Enddarmes vorkommende parasitäre Zerstörungsarbeit und die damit verbundene multiple Teilung (Schizogonie) bei *Entamoeba histolytica* Schaudinn. **Multiple Division Stages of *Entamoeba histolytica* of a Destructive Character within Epithelial Cells of the Large Intestine.** *Zent. f. Bakt.* I. Abt. Orig. 1937. Jan. 15. Vol. 138. No. 3/4. pp. 263–272. With 16 figs.

During the examination of the faeces of a case of amoebic dysentery the author noted the presence of small fragments of intestinal mucosa. He also remarked that within some of the cells of these fragments were varying numbers of small amoeboid organisms which had evidently arisen from certain multinucleate bodies. Though it is not clear from the paper how the connexion between these intracellular structures and the amoeba was determined, it is concluded that they represent a process of intracellular multiplication by multiple segmentation of *Entamoeba histolytica*. As such a method of reproduction of *E. histolytica* has been seen by no other observer it is clear that confirmatory evidence of the author's claim is required. *C. M. W.*

BRUG (S. L.). **Observations on *Dientamoeba fragilis*.**—*Ann. Trop. Med. & Parasit.* 1936. Dec. 23. Vol. 30. No. 4. pp. 441–452. [10 refs.]

An examination of 80 asylum inmates in Holland for intestinal protozoa showed that 36 were infected with *Dientamoeba fragilis*. Culture of the amoeba is facilitated by the addition of small amounts of calcium carbonate to the medium. Cultures can be obtained from solid stools 6½ hours after passage and from liquid stools 13½ hours after. The amoeba is commonly present in solid stools. Culture will not take place at laboratory temperature, a fact which tells against the view that this is a free-living amoeba which may parasitize man. Culture fails if there are not sufficient bacteria in the medium. This may be assured by the use of a large inoculum in the first place, or by the addition of bacteria from old media. In culture media inoculated with this amoeba there is a lag phase, in which the number of amoebae falls before increase due to multiplication occurs. *C. M. W.*

HAKANSSON (E. G.). *Dientamoeba fragilis* : **Some Further Observations**—*Amer. Jl. Trop. Med.* 1937. May. Vol. 17. No. 3. pp. 349–362. [13 refs.]

By the repeated examination of 38 inmates of an asylum during the course of one year it was determined that new infections with *Dientamoeba fragilis* occurred in 16, giving an annual infection rate of 42·1 per cent. Certain familial infections are recorded. It was noted that an infection may be present for a year and a half or it may terminate spontaneously after a longer or shorter period. The amoeba may be recognized apart from its morphological features by its characteristic behaviour when examined in water. There is first distension, followed by rupture of the ectoplasm and discharge of the contents and restoration of the ectoplasm to a spherical shell. In a number of cases carbarsone 0·5 gm. twice daily for two days brought about eradication of an infection. *C. M. W.*

WENRICH (D. H.). **Studies on *Dientamoeba fragilis* (Protozoa). II. Report of Unusual Morphology in One Case with Suggestions as to Pathogenicity.** *J. Parasitology.* 1937. Apr. Vol. 23. No. 2. pp. 183–196. With 32 figs. on 2 plates.

In a child in poor health it was found by stool examination that large numbers of *Dientamoeba fragilis* were present. The blood showed an eosinophilia. The infection appeared to persist for some five years and was ultimately cured by yatren, whereupon the eosinophilia disappeared. In that period an operation for liver abscess was also performed but no microscopical examination was made then. At times the amoebae appeared abnormally large, up to 20μ in diameter, while the number of mononucleate forms varied from 27 to 90 per cent. It would seem that in this case there was reason to regard *Dientamoeba fragilis* as pathogenic. *C. M. W.*

MELENEY (Henry E.) & FRYE (William W.). **Practical Value and Significance of the Complement-Fixation Reaction in Amebiasis.** — *Amer. J. Public Health.* 1937. May. Vol. 27. No. 5. pp. 505–510. [15 refs.]

The authors have tested the value of the complement fixation reaction in cases of amoebic infection in man, monkeys and dogs, and in monkeys and rabbits inoculated parenterally with amoebic extract. Experimentally infected dogs always gave a positive reaction, as also the rabbits and monkeys inoculated with amoebic extract. Naturally and experimentally infected monkeys in most cases failed to give a positive reaction, owing no doubt to the failure of the amoebae to enter the tissues in these animals. In man a positive reaction is obtained in most cases but the occasional negative appears to indicate that the amoebae may sometimes inhabit the intestine without actually invading the tissues, as is the rule with monkeys. In some cases of an obscure type a positive result was obtained and in these an antiamoebic treatment was distinctly beneficial. The test is of value after treatment, for it becomes negative if the infection has been completely eradicated. *C. M. W.*

CRAIG (Charles F.). **Observations upon the Practical Value of the Complement-Fixation Test in the Diagnosis of Amebiasis.** — *Amer. J. Public Health.* 1937. July. Vol. 27. No. 7. pp. 689–693. [16 refs.]

In this paper the author notes that he has practised the complement fixation test for over eight years and has applied it to more than 1,500 cases. Positive results were obtained in 18 per cent. of these cases, and of these 175 were submitted to stool examination with the result that amoebae were found in 157. Of 825 which gave a negative complement fixation test, only twelve showed amoebae on microscopic examination. It is evident that this test for amoebic infection is of considerable value and is applicable to the diagnosis of obscure conditions and to the detection of carriers in surveys. The various uses of the test and its significance are discussed in the paper. *C. M. W.*

DESCHIENS (R.). Considérations sur l'action pathogène d'une souche d'amibes dysentériques (Souche : C. Dobell D.K.B.). [**Pathogenicity of the Dysentery Amoeba Strain C. Dobell, D.K.B.**]—*Bull. Soc. Path. Exot.* 1937. July 7. Vol. 30. No. 7. pp. 562–564.

The author describes experiments which he carried out with a culture strain of *E. histolytica* of human origin which had been given him by DOBELL, who had maintained the strain in culture for 12 years. After six years of culture the conditions were changed by the addition to the culture of other bacteria than those present, with a view to encouraging the amoebae to produce cysts, which hitherto they had failed to do. After a further six years of culture the strain was given to the author, who tested its pathogenicity to kittens by inoculating directly into the terminal part of the small intestine. Of 18 animals thus inoculated 15 acquired acute amoebic dysentery. During the first six years of culture the amoebae had failed to produce dysentery but the culture had then been injected *per rectum* and not into the small intestine. The author, though admitting this difference, wonders whether the change in bacteria in the culture had been the means of increasing the pathogenicity of the amoebae. *C. M. W.*

PATIÑO MAYER (Candido) & PATARO (Francisco A.). Hepatitis crónica y brotes agudos con ictericia, por amebiasis. [**Chronic Hepatitis with Acute Exacerbation and Jaundice associated with Amoebae.**]—*Prensa Méd. Argentina.* 1937. Nov. 10. Vol. 24. No. 45. pp. 2139–2154. [28 refs.]

The case described is that of an Italian, aged 27 years, who suffered for four years on and off from acute attacks of enlargement of the liver with jaundice, but in the intervals was apparently in good health. He also exhibited certain complications, at one time bronchial, at another pneumonia and pleurisy with serofibrinous exudate. The attacks of hepatitis yielded to emetine. Repeated examination of the faeces failed to discover any entamoebae. The author holds that amoebic hepatitis may occur as simple congestion, or as a necrotic and suppurating process, acute or chronic, or as a cirrhotic condition. Amoebic hepatitis with jaundice but not cachexia is not common. The jaundice he ascribes to " amoebic hepatosis," occurring in a liver whose tissue is already reduced in resistance to, it may be, extraneous organisms ; or, less often, to pressure on the intrahepatic canals.

H. H. S.

SANNER (L.) & DESTRIBATS. Sur un cas d'abcès amibiens multiples du foie. [**Multiple Amoebic Abscess of the Liver.**]—*Bull. Soc. Path. Exot.* 1938. Apr. 6. Vol. 31. No. 4. pp. 319–322. With 1 fig.

The patient was a soldier who, though not feeling very well, had played football four days before coming to hospital. He had a temperature of 37·9°C., slight icteric tinge, some enlargement of the liver, to two fingers'-breadths below the right costal margin [the upper limit is not stated] with tenderness but not marked pain. In ten days he had 64 cgm. of emetine which eased the tenderness without reducing the size of the liver. Three weeks later his temperature which had been in the neighbourhood of 37°C. rose to 39° and over, and râles

were audible at the right base behind. Abdominal distention was thought to indicate a subphrenic abscess. At operation pus was obtained from the liver. Three days later signs of peritonitis appeared and the patient died. At autopsy, three abscesses were found in the right lobe of the liver and one, the largest and not that which had been found at operation, had ruptured. There is no mention of any previous dysentery, nor, beyond the fact that organisms were not found in the pus, is there any proof that the abscesses were amoebic in origin. Amoebae were not seen in the pus; they were not looked for in the walls of the abscesses. *H. H. S.*

PALMER (Rex B.). Changes in the Liver in Amebic Dysentery with Special Reference to the Origin of Amebic Abscess.—*Arch. Pathology.* 1938. Mar. Vol. 25. No. 3. pp. 327–335. With 2 figs.

MELENEY (Henry E.) & FRYE (William W.). **The Effect of Direct Animal Passage on the Pathogenicity of** *Endamoeba histolytica* **for Kittens.**—*Amer. Jl. Hyg.* 1937. Mar. Vol. 25. No. 2. pp. 313–326. [10 refs.]

Two strains of *Entamoeba histolytica* which had been maintained in culture for some time were found to differ considerably in their pathogenicity for kittens. Both strains were passed through seven dogs (rectal inoculations) and then inoculated to kittens. Both strains were found to have an increased pathogenicity for kittens but, as before, one was more pathogenic than the other. Passed into culture again the first passage showed a fall in pathogenicity which was, however, higher than that of the original cultures. The original degree of pathogenicity was regained after a year's cultivation. It is concluded that the increased pathogenicity resulting from animal passages is due to the better conditions of nourishment found in the animal intestine as compared with those in culture media. *C. M. W.*

HINMAN (E. Harold) & KAMPMEIER (R. H.). **Clinical Intestinal Amebiasis. A Study of 400 Cases from Charity Hospital at New Orleans.**—*Amer. Jl. Trop. Med.* 1937. Mar. Vol. 17. No. 2. pp. 263–278. With 1 map.

As the title states, the paper gives the details of a clinical study of 400 cases of intestinal amoebiasis which were admitted to hospital for symptoms referable to the amoebic infection. Practically the entire group represents the diarrhoeic and dysenteric stage rather than the carrier form of the disease. The cases are carefully analysed from the point of view of race, age, sex, locality of infection, temperature, pain, mortality, incidence of liver abscess and so on. Those interested in such details must consult the paper in the original. *C. M. W.*

PURCELL (F. M.). A Case of Amoebic Hepatic Abscess and Associated Pericarditis.—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1938. Apr. 20. Vol. 31. No. 6. pp. 689–690.

NIÑO (Flavio L.). Amebiasis intestinal ulcero-necrótica y tumor amebiano del ciego y colon ascendente. [**Ulcero-necrotic Intestinal Amoebiasis and Amoebic Tumour of the Caecum and Ascending Colon.**]—*9a Reunión Soc. Argentina Patol. Regional, Mendoza, 1, 2, 3* y *4 octubre 1935.* Vol. 2. pp. 813–843. With 23 figs. (3 coloured) & 1 chart. [23 refs.]

The paper describes in detail the case of a man who, suffering from amoebiasis, developed a tumour termed a tuberculoma of the caecum and ascending colon. This was removed by operation, from which the patient did not recover. Histological examination of the tumour revealed a heavy amoebic infection which extended also to other parts of the large intestine. *C. M. W.*

MOHAMAD. Door amoeben veroorzaakte perforatie van de appendix. [**Amoebiasis and Perforated Appendix.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1937. Sept. 7. Vol. 77. No. 36. pp. 2171–2174. With 1 plate. English summary (3 lines).

A Chinese adult, 31 years of age, living in Surabaya was seized with acute abdominal pain after a week of symptoms pointing to appendicitis. Ruptured appendix was diagnosed and operation performed; an abscess was found and the appendix was perforated. The patient did not survive. Examination of the appendix revealed numerous *E. histolytica* in the borders of the perforation. *H. H. S.*

HUARD (P.). Les localisations chirurgicales extraintestinales lointaines de l'amibiase (foie excepté). [**Extraintestinal Surgical Amoebiasis elsewhere than in the Liver.**]—*Bull. Soc. Méd.-Chirurg. Indochine.* 1937. Apr. Vol. 15. No. 4. pp. 327–355. [Refs. in footnotes.]

In this long paper the author reviews the records which have been made of amoebiasis of parts of the body other than the intestine and the liver. These include the lungs and pleura, the brain, the spleen, the urinary and genital systems, lymphatic glands and the skin. Certain records are discussed as unreliable, but others are accepted as probably correct. The general conclusion is that in all these situations amoebae may occur as direct extensions from the intestine or liver, or as metastases from these primary foci. *C. M. W.*

BISOGNI (G.). Le localizzazioni rare della amebiasi. [**Amoebiasis in Unusual Situations.**]—*Giorn. Ital. di. Clin. Trop.* 1937. Apr. 30. Vol. 1. N.S. No. 4. pp. 113–115.

An article calling attention to the possibility of invasion of the liver, lungs and brain by *Entamoeba histolytica*, with remarks on the symptoms. *C. M. W.*

WESTPHAL (Albert). Betrachtungen und experimentelle Untersuchungen zur Virulenz der *Entamoeba histolytica* beim Menschen. [**Virulence of *E. histolytica* in Man.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1937. Feb. Vol. 41. No. 2. pp. 262–279. With 2 figs. [48 refs.]

The author describes an experiment in which an individual acquired a harmless *E. histolytica* infection (carrier condition) by the ingestion

of cysts from a case of acute amoebic dysentery. Some months later, the harmless infection persisting, cultures of bacteria isolated from the faeces of a case of acute amoebic dysentery were ingested by the healthy carrier and a control. Both the carrier and the control suffered from diarrhoea, the former in three days and the latter in ten days. On the 23rd day the carrier experienced an attack of acute amoebic dysentery. After an interval of freedom from symptoms a relapse occurred and it was possible to demonstrate that this amoebic dysenteric attack was associated with a Flexner Y infection. It would seem that a bacterial background may, as in the case described, be the determining factor in rendering *E. histolytica* pathogenic, as distinct from producing the carrier condition. Whether this is a general rule or not future investigations alone will show, but it is a theory which seems worthy of consideration. It is pointed out that in the case of the well-known Chicago outbreak of amoebic dysentery the dysenteric symptoms in certain cases occurred within two days of exposure to the contaminated water supply, a state of affairs which suggests that a bacterial infection was acting upon individuals who were already carriers of *E. histolytica.* *C. M. W.*

YOKOYAMA (T.). **Mixed Infection of Bacillus Dysenteriae and Dysentery Amoebae.**—*Jl. Oriental Med.* 1937. Mar. Vol. 26. No. 3. [In Japanese pp. 497–502. With 1 fig. English summary p. 42.]

During the study of 153 cases of bacillary dysentery in Manchuria the author has noted that in 7 cases, as the bacillary dysentery condition subsided and when dysentery bacilli could no longer be detected, amoebae of the vegetative type appeared. It is concluded that these were cases of bacillary dysentery superimposed on a carrier condition of dysentery amoebae. *C. M. W.*

SGROJ (Diego). Considerazioni su di un caso di intolleranza e di ipersensibilità secondaria all'emetina ed ai pentarsoli. [**A Case of Intolerance and Hypersensitivity to Emetine and Arsenic.**]—*Riv. Sanitaria Siciliana.* 1937. Aug. 1. Vol. 25. No. 15. pp. 885–887.

The patient, a woman of 38 years, two years before suffered from amoebic dysentery and was treated with emetine, 6 cgm. daily for 10 days, followed by stovarsol in doses of 75 cgm. daily, 3 tablets each of 25 cgm., for ten days. Great improvement resulted ; pain ceased, the diarrhoea lessened, tenesmus disappeared and the general state became better. A month later the symptoms returned and similar treatment again resulted in benefit. Fluctuations in her condition occurred for the next two years when she again came under observation and *E. histolytica* was seen in the faeces. She was given cachets containing amoebarsen, two daily each containing 25 cgm. ; after 12 days she showed symptoms of poisoning—marked weakness, hyperaesthesia, diminished reflexes, vomiting, slow pulse (48), abdominal pains and diarrhoea. The drug was stopped and stimulants —camphor, adrenalin, glucose, etc.—given and improvement followed in three days. Later, emetine hydrochloride, 3 cgm. was given, and twelve hours later, the patient exhibited cardiac weakness, small pulse, 66 per minute (she had had 25 " drops " of Tr. digitalis), low arterial tension and marked asthenia. The author concludes that it is

a mistake to treat patients with amoebiasis by repeated small doses of emetine or arsenicals; to avoid hypersensitivity adequately large doses should be given to cure when beginning treatment. *H. H. S.*

GIRGES (Ramses). **The Treatment of Entamoebiasis and Other Intestinal Troubles with Iodochloroxyquinolin (Entero-Vioform).**—*Jl. Egyptian Med. Assoc.* 1937. Apr. Vol. 20. No. 4, pp. 154–166. [18 refs.]

The paper gives an account of the treatment of intestinal amoebiasis, both the acute and chronic form, by means of entero-vioform, which is sold in the form of tablets each containing 0·25 gm. of iodochloroxyquinolin and sufficient sapamine (sulphomethylate of p-stearyl aminophenyl-trimethyl ammonium) to help in emulsifying and distributing the active principle in the lumen and on the walls of the intestine. The author states that during the past eighteen months he has treated 279 cases. Acute cases were given orally after the chief meals, for a period of seven to ten days, three to four tablets of the drug a day. Sometimes the course was repeated after an interval of a week or ten days. In chronic carrier cases, in addition to the oral treatment rectal enemata are given each night. Each consists of 150–200 cc. of warm water in which are crushed two to eight tablets. In each course eight to twelve enemata were given, the dose of drug being increased during the course. Cases of definitely diagnosed bacillary dysentery as well as other cases of intestinal disturbance were benefited by oral administration of the drug. The conclusion is that enterovioform is the drug *par excellence* for entamoebic dysentery, the margin between the therapeutic and toxic doses being very great. It is especially useful in cardiac cases, in which emetin is contraindicated, and in chronic carrier or emetin-resistant cases. *C. M. W.*

IZAR (Guido); SCUDERI (Francesco); LENZI (Franco). Studi sull' amebarsene. Nota I. Azione su soggetti sani [IZAR & SCUDERI]. [**Amoebarsen. Its Action on Healthy Subjects and in Cases of Chronic Intestinal Amoebiasis.**]—*Boll. Istituto Sieroterap. Milanese.* 1938. Jan. Vol. 17. No. 1. pp. 1–10. German summary (5 lines). **Nota II. Azione terapeutica nella amebiasi intestinale cronica** [IZAR & LENZI].—*Ibid.* pp. 11–15. German summary (4 lines).

The authors studied the effects of ordinary therapeutic doses of amoebarsen [the formula of this is not given], 0·75 gm. daily in 3 doses of 0·25 gm. by mouth, or 0·5 gm. in two doses of 0·25 gm. and by daily enema of 1 gm. in 100 cc. of 2 per cent. bicarbonate of sodium, noting the effects on the urine, the corpuscle counts, van den Berg reaction and blood pressure. They concluded that it produced no lesions of the internal organs, that the drug was well tolerated and was haemopoietic.

For treatment of patients the authors gave to adults 30 capsules of 22·5 cgm. in 15 days; some could tolerate three capsules daily; children from 8–10 years were given one a day for 10 days. By enema the maximum dose was 1 gm. given as stated above in 100 cc. of 2 per cent. $NaHCO_3$ for 10 days, more usually for 7 days only. Sixty patients were treated, but it would appear from the summary of results that emetine was also given. The authors state that in 52 the faeces

showed no amoebae " after the second course of emetine and amebarsene," but in 7 of them the amoebae and cysts reappeared. The other eight were chronic patients who had been ill for a long time ; the amoebae disappeared from them after the third course. None showed any signs of intolerance. No details of the cases treated are given.

H. H. S.

RADNA (R.). Sur le traitement de l'amibiase intestinale par l'iodoforme. [**Treatment of Intestinal Amoebiasis with Iodoform.**]—*Ann. Soc. Belge de Méd. Trop.* 1938. Mar. 31. Vol. 18. No. 1. pp. 81–83.

Iodoform for treatment of amoebic colitis was advocated by CASTELLANI in 1935 [see this *Bulletin*, 1936, Vol. 33, p. 546, and 1937, Vol. 34, p. 956]. The author records the results of similar treatment in eleven cases of amoebic dysentery and in four cyst-passers. The dosage is as follows : 1st day a keratin capsule containing 5 cgm. ; 2nd day two capsules, 3rd day, four ; 4th day onwards, six capsules. The course is from 15 to 22 days. Re-examined 15 days later all were negative, as they were also after a month. Examination during the ensuing six months revealed one relapse after four months, but this patient lived in a district where the disease was common and he may have been reinfected. In the cyst-passers no cysts were found in the stools after 12–16 days. [The length of time that these have remained negative is not stated.] *H. H. S.*

BHATTACHARJEE (Jagdish C.). **Treatment of Intestinal Amoebiasis. (Recent Views on the Use of Amoebicidal Drugs.)**—*Med. Bull.* Bombay. 1937. June 19. Vol. 5. No. 12. pp. 374–378. [12 refs.]

This is a general account of intestinal amoebiasis and the method of administration of the various drugs which have been employed for its treatment. *C. M. W.*

MEYER (Walter). Die amöbizide Wirkung organischer Säuren biologischer Herkunft. [**Amoebicidal Action of Biological Organic Acids.**]—*Zent. f. Bakt.* I. Abt. Orig. 1937. Aug. 10. Vol. 139. No. 7. pp. 382–396. [20 refs.]

The author notes that when animals are inoculated with *E. histolytica* only about 25 per cent. become infected. This is due either to specific resistance or to the nature of the intestinal contents. The latter possibility led him to investigate the action of certain fermentation acids on the amoeba by means of the inverted cover glass method of cultivation. Acids in descending order of amoebicidal activity could be arranged as follows—lactic, tartaric, acetic, butyric, succinic, citric and malic. This activity appears to be due solely to the negative ion of the acids and not to *p*H variations, against which special precautions were taken. It is thought that the results might afford some indications for therapeutic measures. *C. M. W.*

EPSTEIN (G. W.) & AWAKIAN (A.). **Studies on the Intestinal Protozoa of Rats. I. Rats as Carriers of Dysenteric Entamoebae.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1937. June 25. Vol. 31. No. 1. pp. 87–92. With 8 figs. on 1 plate.

AWAKIAN (A.). **Studies on the Intestinal Protozoa of Rats. II. Rats as Carriers of Balantidium.**—*Ibid.* pp. 93–98. With 5 figs. on 1 plate. [19 refs.]

In these two papers are described the discovery of *Entamoeba histolytica* and *Balantidium coli* in wild rats caught in Moscow, and the steps which were taken by culture and inoculation to prove that the amoeba and ciliate were actually the species they resembled.

C. M. W.

VIRNICH (A.). Ueber Darmflagellaten in Shanghai. [**Intestinal Flagellates in Shanghai.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1937. Feb. Vol. 41. No. 2. pp. 283–295. With 10 figs. [28 refs.]

The author has observed one hundred and three cases of intestinal flagellate infection in Shanghai due to Trichomonas, Chilomastix or Lamblia. The conclusion is that all may be pathogenic, Trichomonas being the least and Lamblia the most. The symptoms of the cases are discussed, as also the treatment, which admittedly has not been very satisfactory. The best results appear to have been obtained with intramuscular injections of solu-salvarsan. *C. M. W.*

SPANGENBERG (J. J.), MUNIST (L.) & ARDAIZ (A.). Consideraciones acerca de la localización habitual de las giardias en el tubo digestivo. [**Usual Situation of Giardia in the Digestive Tract.**]—*Arch. Argentinos Enferm. Aparato Digest. y Nutric.* Buenos Aires. 1937. Apr.–May. Vol. 12. No. 4. pp. 372–381.

A patient with symptoms of cholecystitis was found to have large numbers of Lamblia in the liquid withdrawn by duodenal tubage. The gall bladder was removed by operation and the patient made a good recovery. Careful examination of the contents of the gall bladder and the walls by serial sections failed to reveal any flagellates which, however, could still be obtained in abundance by tubage of the duodenum. It seems evident, therefore, that the presence of Lamblia in fluid withdrawn from the duodenum, even in cases suffering from symptoms referable to the gall bladder, is no indication that they occur in this organ. Such observations as those recorded in this paper are of the greatest importance at the present time, when there is an increasing tendency on the part of clinicians who have had little experience of parasitology to ascribe to Lamblia infections all manner of symptoms and syndromes and to assume without any evidence whatever that the flagellates enter the bile duct, gall bladder and the higher biliary passages. *C. M. W.*

MORENAS (L.). Lambliose biliaire: vomissements périodiques et troubles nerveux. [**Lamblia Infection causing Vomiting and Nervous Symptoms.**]—*Bull. et. Mém. Soc. Méd. Hôpit. de Paris.* 1937. Feb. 22. 53rd Year. 3rd Ser. No. 6. pp. 231–236.

The paper describes in detail the case of a man 33 years of age who suffered from periodic attacks of vomiting followed by diarrhoea and

associated with various nervous symptoms including asthenia, wasting, polyneuritis of the lower limbs and some pigmentation of the skin. Though there were indications of hereditary syphilis it is concluded that the actual cause of the trouble was a Lamblia infection, which proved very resistant to treatment. *C. M. W.*

ENAULT (M.). Un cas de colite à *Giardia*. Traitement créno-médicamenteux. Résultat. [**A Case of Lamblial Colitis : Spa and Drug Treatment.**]—*Bull. Soc. Path. Exot.* 1937. May 12. Vol. 30. No. 5. pp. 379-381.

The case described is that of a woman 50 years of age who, amongst other complaints, suffered from a chronic gastro-enteritis which was associated with a Lamblia infection. The flagellate infection appears to have been eradicated by the administration of a number of drugs of which bismuth subnitrate in large doses seems to have been the chief. *C. M. W.*

ECHEMENDÍA (José). La lambliasis, importancia y concepto actual del tratamiento. [**Modern Treatment of Lambliasis.**]—*Rev. Parasit., Clin. y Lab.* Habana. 1936. July–Aug. Vol. 2. No. 4. pp. 611–619.

The article is a general account of the condition which is becoming known as lambliasis, in which many and varied symptoms are attributed to the presence of the flagellate in the intestine. It is said to be one of the most important causes of infantile gastro-enteritis. The author still clings to the notion that the organisms may invade the biliary system, in spite of the fact that no satisfactory evidence of their ever spreading there from the duodenum has been obtained. A number of remedies for the treatment of the condition are discussed.

C. M. W.

MARTIN (Pierre). Nouveau traitement de la lambliase par un dérivé d'acridine. [**New Treatment of Lamblia Infection by a Derivative of Acridine.**]—*Rev. Méd et Hyg. Trop.* 1937. Jan.–Feb. Vol. 29. No. 1 pp. 33–36.

——. Sur un nouveau traitement de la lambliase. [**New Treatment of Lamblia Infection.**]—*Marseille-Méd.* 1937. Apr. 5. Vol. 74. No. 10. pp. 392–394.

The author claims that atebrin, or the French equivalent quinacrine, in the doses employed for the treatment of malaria will rid the majority of cases of lambliasis of their flagellates. In a few cases it may be necessary to repeat the course once or twice. Though the infection responds to both oral and subcutaneous administration of the drug, the author prefers to give it by the mouth. *C. M. W.*

IRAZABAL-LUIGUI. Etudes expérimentales sur le traitement de la lambliase. [**Experimental Treatment of Lamblia Infection.**]—*Ann. Parasit. Humaine et Comparée.* 1937. Jan. 1. Vol. 15. No. 1. pp. 29–45. [37 refs.]

The paper describes attempts which were made to rid mice of a naturally occurring Lamblia infection by the administration of various

drugs. The best results were obtained with an emulsion of turpentine which, however, is not regarded by the author as a specific remedy.

C. M. W.

BRUMPT (Lucien). Traitement expérimental de la lambliase. [**Experimental Treatment of Lamblia Infection.**]—*C. R. Soc. Biol.* 1937. Vol. 124. No. 11. pp. 1040–1042.

Carefully conducted experiments on Lamblia-infected mice have shown that, of all the treatments tested, oral administration of a 1 per cent. solution of " quinacrine " for five days alone was able to bring about a cure, which was obtained in 80 per cent. of the animals to which it was administered. *C. M. W.*

CALLENDER (Geo. R.) & INMON (Ebner H.). Diarrhea, Enteritis, and Dysentery.—Reprinted from *Army Med. Bull.* Ancon, Canal Zone. 1937. July. pp. 24–75. With 2 figs. [31 refs.]

WOLFF (J. W.). Dysenterie Sonne ter Oostkust van Sumatra. Bijdrage tot de epidemiologie der bacillaire dysenterie. [**Sonne Dysentery on the East Coast of Sumatra.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1938. Apr. 5. Vol. 78. No. 14. pp. 762–780. With 5 graphs. [59 refs.] English summary.

HELMINTHIASIS.

PÉTRASSOV (V. F.) & ALEXÉIEV (K.). Cours de l'invasion par les helminthes parmi différents groupes de la population dans quelques villes de la région industrielle d'Ivanovo de 1925–1934. [**Varying Incidence of Helminthic Infections of Different Groups in the Industrial Area of Ivanovo.**]—*Med. Parasit. & Parasitic Dis.* Moscow. 1937. Vol. 6. No. 3. [In Russian pp. 378–388. With 5 charts. French summary p. 388.]

The varying percentage of intestinal helminthiasis, as detected by a method unstated in the summary, is given over 10 years or less.

Total detected infections were 43·5 in 1927, 33·7 in 1928 and 34·2 in 1932. For school-children they fell from 75·8 in 1925 to 43·0 in 1934; for the non-organized population from 32·5 in 1929 to 15·0 in 1933, for organized adults (workers in the food industry) from 37·2 in 1930 to 27·2 in 1933. *Clayton Lane.*

KOURÍ (Pedro), BASNUEVO (José G.) & CALVÓ FONSECA (Rafael) Porcentaje y distribución geografica del parasitismo intestinal en Cuba. [**Prevalence and Geographical Distribution of Intestinal Parasites in Cuba.**]—*Rev. Med. Trop. y Parasit.* Habana. 1937. Nov.–Dec. Vol. 3. No. 6. pp. 481–496; 497–508; 509–513.

This series of three papers deals with the intestinal parasites found in various districts, but the number of persons examined in any one district is too small to allow of any inference of value. In Pedro Betancourt 103 were subjected to faecal examination; helminthic infestation—Trichuris, Ascaris and Necator—was found in 46 (44·6 per cent.) and another 13 (12·6 per cent.) had protozoa also—*E. coli* and Giardia. In Unión de Reyes 93 were examined and 51 (54·8 per cent.) were infested. In Jagüey Grande 155 examinations revealed 71 (61·8) positive. Several other districts were investigated but the numbers were so few that no useful purpose would be served by quoting them. In the Province of Matanzas altogether, in twenty-one districts, a total of 1,391 was examined and 956, or 68·7 per cent., were parasitized. The detailed findings are presented in tables.

H. H. S.

CRENN (R.). Le parasitisme intestinal et ses conséquences dans la région de Bourail (Nouvelle-Calédonie). [**Intestinal Parasitism and its Results in New Caledonia.**]—*Marseille-Méd.* 1937. Nov. 5–15. Vol. 74. No. 31–32. pp. 424–430.

The discovered incidence of intestinal infection here, mostly with ankylostomes, lay between 74·7 and 100, the essential symptom is colitis, and the treatment Manson's mixture for worms, and bismuth and other remedies for the intestinal discomfort.

The number of persons examined, presumably by smear, was 426, the infections detected were 320 with hookworms, 50 with trichuris, 53 with lamblia, 29 with strongyloides and 5 with such as ascaris and taenia. The abdominal pain is along the ascending colon. Faeces are simply deposited on the soil. *C. L.*

CHEN (H. T.). **Parasites in Slaughter Houses in Canton. Part III. Trematodes and Cestodes Parasitic in the Alimentary Tract of Buffaloes.**—*Lingnan Sci. Jl.* 1937. Vol. 16. No. 4. pp. 585–590. With 4 figs. [14 refs.]

The six parasites from buffaloes here considered include *Eurytrema pancreaticum* (Janson, 1889) which has been reported from man. A description is given and *Eu. coelomaticum* (Giard and Billet, 1892) is held to be a synonym. *C. L.*

TUBANGUI (Marcos A.) & MASILUÑGAN (Victoria A.). **Studies on the Cercaricidal Property of the Sera of Vertebrate Animals.**—*Philippine Jl. Sci.* 1936. Aug. Vol. 60. No. 4. pp. 393–398.

" Tests were made to determine the cercaricidal property of the sera of different kinds of vertebrates against two species of larval trematodes; namely, the cercaria of *Schistosoma japonicum* and of *C. maitimensis* Tubangui, 1928. All the sera tested, except those of the cat and the rabbit, possessed marked cercaricidal action against the cercaria of *Schistosoma japonicum*. On *C. maitimensis* the effect was only partial.

" The cercaricidal titers of the different sera against the cercaria of *Schistosoma japonicum* varied within appreciably wide limits. The titers of the sera of man, guinea pig, and other warm-blooded vertebrates which are known to serve as favourable hosts to the adult parasite, were found to be uniformly low, while those of the sera of cold-blooded vertebrates that are not susceptible to the parasite were much higher.

" The cercaricidal (cercariolytic), bacteriolytic, haemolytic, and other cytolytic properties of the blood are probably analogous phenomena due to the union of the corresponding antigens with antibodies of the third order and complement. The fresh normal sera of the cat and the rabbit possess no cercaricidal property, due probably to a deficiency in both amboceptor and complement.

" The cercaricidal titer of the serum of a guinea pig infected with *Schistosoma japonicum* was found to be much higher than that of the serum of a normal animal belonging to the same species, due apparently to an increase in the amboceptor content of the blood as a result of the infection."

C. L.

BUCHANAN (R. M.). **A Comparative Study on Schistosomiasis in the Berber Region of the Anglo-Egyptian Sudan.**—*Jl. Helminthology.* 1937. Dec. Vol. 15. No. 4. pp. 183–202. With 4 figs. [37 refs.]

" Success in the elimination of Schistosomiasis will only be achieved by elimination of the intermediate host: in short the key to the problem as a whole, is *sanitation, not medication.*"

Irrigation in this Province is of three kinds: Waterwheels (Sagia) drawing from river or well, a counter-balanced bucket on a beam (Shaddoof), or a mechanically driven pump. In the case of the first two the water as drawn runs rapidly along the narrow channels, and since no more is put into them by man or animal power than is really needed they dry between waterings so that Buchanan has never seen snails in Sagia ditches. With pumping, the tendency is to over-water, leaving a sluggish current, the water being used for all domestic purposes; and since the pump delivers snails into the canals (indeed the river silt may be composed of miriads of miniature snails) the vicious circle in human infection and the repopulation by snails of

irrigation channels carefully cleared are both assured. A seasonal variation in vesical disease is seemingly related to pools and stagnant creeks left by the falling Nile or to lowered resistance from seasonal overwork, malaria, or underfeeding. Although *S. haematobium* and *S. mansoni* may both be present in a single agricultural scheme in this Province, in only two cases, both young men, have the ova of the two species been found in the same faeces. "The influx of snails is from the river and main canal, though conditions for multiplication are optimal in the terminal canals. A sufficient distinction is not always drawn between infestation of river and canals with snails and *infection* of these localities with Bilharzia." Where infection with *S. mansoni* is present, percentage infection figures have been 35·1 and 55; whereas of 2,590 examined for *S. haematobium* the infection percentage was 3·4. Urinary bilharziasis is primarily a disease of children and few infections were found in those over 25 years old; infection with *S. mansoni* increases with age and the number of eggs in a faecal smear is not related to the severity of symptoms. Although albuminuria may be present without blood or ova, Buchanan has never found ova without concomitant albuminuria. In prevention the first essential is held to be the provision of wells, the second the finding of a suitable type of latrine. Great importance is laid on propaganda. Details are given of methods directed against snails in canals. *C. L.*

DOWDESWELL (R. M.). **Schistosomiasis in the Kavirondo District of Kenya Colony.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1938. Apr. 20. Vol. 31. No. 6. pp. 673–688. With 2 text figs. & 2 figs. on 1 plate. [65 refs.]

It is concluded that *Physopsis nasuta* is an intermediate host of *Schistosoma bovis* in Central Kavirondo, and that *Ph. nasuta*, or *Bulinus forskali*, or both, act as such for *S. haematobium*.

Central Kavirondo lies to the north of the gulf of the same name in Lake Victoria; urinary schistosomiasis is strictly limited to a small strip of land 20 miles long and 4 miles wide on the northern shore of the gulf and rising a few hundred feet from the lake level of 3,700 feet. Examination of the urine of all the 123 children showed schistosome eggs in 88 and red cells in 17 more, so that some 85 per cent. are infected. Of the snails, identified by Major CONOLLY, the only one emitting furcocercariae was *Ph. nasuta*. Water containing such cercariae, got from wild snails, was placed in contact with the shaved skin of 5 rabbits; 4 showed no infection when later examined, in the fifth were found 2 males, 2 females, and 2 immature males. They were "identified by Professor LEIPER as *S. bovis*, one female having in its uterus typical *S. bovis* ova, while the other had several eggs with *S. haematobium* outlines, and one typical *S. bovis* egg." Again "Even the adult *Schistosoma bovis* can be confused with *S. haematobium* unless a careful examination is made . . . for apart perhaps from the extent of the vitelline glands, the shape of the ova is the only very distinctive difference." And once more "No animal schistosomiasis has been reported in Central Kavirondo, and in the whole of Kenya only two cases, occurring in bullocks in the neighbourhood of Nairobi, have been seen by Mr. R. DAUBNEY, of the Veterinary Research Laboratory."

"Cases of *S. mansoni* infection (intestinal) have been seen in another area of Central Kavirondo in natives, who state that they have never left

the district and it seems likely that *P. stanleyi* Smith is the intermediate host here. A careful survey of the snail distribution in the Colony would be of great value in assisting to elucidate the factors involved in the distribution of the disease as well as the vectors concerned, and an investigation of animal schistosomiasis would also be of great interest."

[Such a snail survey, comparing species within and outside the endemic areas of infections, should prove a valuable guide to infection studies.] *C. L.*

SCOTT (J. Allen). **The Regularity of Egg Output of Helminth Infestations, with Special Reference to** *Schistosoma mansoni*.—*Amer. Jl. Hyg.* 1938. Jan. Vol. 27. No. 1. pp. 155–175. [16 refs.]

The author's summary is as follows :—

" Dilution egg counts were made on all stools passed during a 30-day period by three Egyptian peasants harbouring the hookworm *Ancylostoma duodenale* and the blood fluke *Schistosoma mansoni*. Similar determinations were made on four or five consecutive stools passed by each of 87 other persons harbouring one or both of these worms. It was shown that the hookworm egg output of these cases was no more variable than that of other cases reported in the literature. Furthermore, the output of eggs of *S. mansoni* was no more variable than that of hookworms in the same cases. It would seem that, as far as the variability of egg output is concerned, it is justifiable to use the dilution egg count method for studies of infestations of *S. mansoni* similar to those successfully carried out with hookworm infestations. Analysis of data presented here, and of those available in the literature, indicates that egg output of all species so far studied is less variable when expressed in terms of eggs per cc. of stool than in terms of eggs per unit of time. The implications of the latter conclusion permit considerable simplification in the methods of presenting helminth egg count data."

To those who wish to know what value egg counts have in estimating the weight of infection in a particular patient, a knowledge of the following details of this work is essential. The method of egg counting was that of STOLL, and the figures all apply to the number of eggs in 1 cc. of stool. In Case A those of *Ancylostoma duodenale* varied between 1,167 and 0, of *S. mansoni* between 2,867 and 267 ; in the same two consecutive stools the eggs of the former were 1,167 and 167, and of the latter 1,367 and 2,500 ; in the stool in which the fluke eggs were 2,867, the maximum, the hookworm eggs were 133 and were lower twice only, namely 67 and 0. In Case B hookworm eggs varied between 1,833 and 233, those of the fluke between 2,067 and 300, and when schistosome eggs were highest (2,067) those of the hookworm were 467. In Case C the parallelism of the egg discovery from the two species was closer, the maximum of 11,667 for hookworms going with a near maximum of 1,400 for the fluke, the actual maximum being 1,433, yet the minima were 2,233 and 233. *C. L.*

DE MELLO (Indalencio Froilano). Sur les mollusques indiens pouvant servir d'hôtes éventuels dans la transmission de la bilharziose urinaire. [**Indian Molluscs which are Possible Transmitters of Urinary Schistosomiasis.**] –Reprinted from *C. R. XIIe Congrès Internat. Zool. Lisbonne 1935*. pp. 2084–2095. [29 refs.]

On Indian molluscs which can transmit bilharziasis. A child of an African soldier by a Hindu mother was brought to hospital with

dysentery and haematuria and examination showed eggs of *S. haematobium* both in faeces and urine, and on their right identification de Mello has no doubt at all, or that an autochthonous case of this infection has been established at Valpoi. Among the molluscs found there was *Melanoides tuberculatus*, which GOPSILL [this *Bulletin*, 1933, Vol. 30, p. 208] believed to be the larval host in the Lower Shire District. Again, *Limnaea lutcola pinguis* has attracted these miracidia with some penetration, so that further studies are called for. *C. L.*

WU (Kuang). **Cattle as Reservoir Hosts of** *Schistosoma japonicum* **in China.**—*Amer. Jl. Hyg.* 1938. Mar. Vol. 27. No. 2. pp. 290–297. With 2 text figs. & 4 figs. on 2 plates. [34 refs.]

The first quantitative study of the incidence of schistosomiasis in cattle (oxen and water buffaloes) at Shanghai.

Small portions of liver were taken from cattle killed in municipal slaughter-houses between December 1936 and May 1937. The numbers examined and the percentages found infected month by month were: for oxen, 50 and 26, 29 and 34·4, 98 and 18·3, 56 and 10·7, 118 and 0·84, 48 and 4·2, total and average 399 and 12·6; for buffaloes, 15 and 13·3, 100 and 20, 53 and 20·7, 113 and 24·2, 123 and 13·8, 12 and 8·3, total and average 416 and 18·7. Infection was proved by digesting liver portions in 10 per cent. caustic soda solution at 37°C. for 24 hours and searching the sediment for eggs. Faeces and liver could never be got from the same beast; these last generally came from the Chekiang Province where man is heavily infected. Sections from the liver show a ray-like structure round eggs like that seen by HOEPPLI in experimentally infected rabbits. The schistosomes got from the veins of cattle are illustrated. The author has found that eggs in semi-solid stools cease to be viable after 6 days at about 20°C. Cattle are then significant in the spread of Japonic schistosomiasis. *C. L.*

PONS (Juan A.). **Studies on Schistosomiasis Mansoni in Puerto Rico. V. Clinical Aspects of Schistosomiasis Mansoni in Puerto Rico.**—*Puerto Rico Jl. of Public Health & Trop. Med.* 1937. Dec. Vol. 13. No. 2. pp. 171–254. With 10 graphs & 8 figs. on 4 plates. [32 refs.] [Spanish version pp. 255–349.]

A clinical study of Mansonian schistosomiasis in Porto Rico dealing with the subject on the lines of the author's belief that there are two types of this infection, hepatosplenic and intestinal, and that apart from an initial stage common to both there is in every case an early selection of that part which will suffer most.

After prodromal symptoms, in general vaguely intestinal, which marked a latent period of 39 to 45 days in those in whom the date of infection could be fixed to a day, there begins abruptly the initial febrile stage often with a rigor and often accompanied by abdominal discomfort, pain, or colic, or dysenteriform symptoms. Cough was consistently present in cases seen early. Tenderness was invariable over liver, spleen or intestine and often marked over the caecum. In the blood eosinophilia was marked even up to 59·5 per cent. of leucocytes. The first days on which eggs were noted, after fever began and after the date of infection, were as follows—it apparently not, however, being the case that there was a daily stool examination—3 to 9 and 48 in seven patients, and for the rest for one patient in each category 4 and 42,

9 and 42, 13 and 46, 15 and 48, 30 and 49, 29 and unknown, 49 and 98. The factors which determine where the brunt of damage shall fall in the second stage are unknown ; it is an active stage of constant attack and defence for weeks, months or years. " On the offensive side there are the irritation and destruction of tissue and the ' toxaemia ' ; on the defensive, the immunological cellular reactions, most important of which, from the standpoint of pathological physiology, is increasing fibrosis." There are dysenteric episodes, but it is only by abdominal examination that there is found enlargement of both liver and spleen. As to the symptoms at this stage of the intestinal type—" The histories given by various patients are so different from each other that the tabulation of complaints and symptoms is totally impossible. They are almost invariably, however, referred to the gastro-intestinal tract and in the vast majority of cases center about a colitis with dysentery of lesser or greater intensity."

The third stage is one of cirrhosis with, in the hepato-splenic type, enlarged spleen and a liver of varying size, which on physical and blood examinations cannot be distinguished from Banti's syndrome, and with intestinal obstruction in the intestinal type. In addition a number of " miscellaneous cases " are described. The paper is filled with detail, for which it must itself be consulted. *C. L.*

PERDOMO HURTADO (B.). Un caso de hepatitis febril de origen bilarziocica. [**Hepatitis due to** *Schistosoma mansoni*.]—*Gac. Med. de Caracas.* 1937. Oct. 15. Vol. 44. No. 19. pp. 290–291.

[That the hepatitis present in this case was actually due to *S. mansoni* is not, to the reviewer at least, altogether convincing.] The subject was a boy of 14 years, with fever up to 39·5°C., diarrhoea, colic, tenesmus and passage of mucus and blood. The liver was enlarged, from the fourth intercostal space to four fingers' breadths below the costal margin. Blood examination gave 3,370,000 red cells and 10,840 white per cmm., with 58 per cent. neutrophiles and 17 per cent. eosinophiles. The faeces contained cysts of *E. histolytica* and ova of *S. mansoni*. With such a history the diagnosis of amoebic dysentery and hepatitis was natural and emetine and yatren were given, but as no improvement occurred in four days and the schistosome ova were still abundant, fouadin was administered and in two days the fever dropped, diarrhoea ceased and the liver enlargement was reduced ; the patient's appetite returned, his pallor receded and his strength improved. *H. H. S.*

STEIN (H. B.). **Infection of the Gall-Bladder by** *Schistosoma haematobium*.—*South African Med. Jl.* 1938. Apr. 23. Vol. 12. No. 8. pp. 297–298. With 2 figs.

In a Bantu who met his death by violence the gall bladder and biliary system were removed for histological examination which disclosed, fortuitously it seems, schistosome ova (in microscopic sections) which were believed to have terminal spines. They were present both in the gall bladder wall and in the adjacent liver. No other organs had been removed for examination. *C. L.*

STROCKA (Kurt). Beitrag zur Pathologie der Harnblasenbilharziose. [**On the Pathology of Urinary Schistosomiasis.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1938. Feb. Vol. 42. No. 2. pp. 67–74. With 6 figs. [39 refs.]

CAWSTON (F. Gordon). Bilharzia Disease.—*Jl. Trop. Med. & Hyg.* 1937. Dec. 15. Vol. 40. No. 24. pp. 318–322. With 4 figs.

DIAMANTIS (A.). Considérations sur la chimiothérapie antibilharzienne en Egypte a propos du " Fouadin Tolerance Test " du Prof. Khalil Bey. [**Chemotherapy of Bilharziasis in Egypt, with reference to Khalil's Fouadin Tolerance Test.**]—*Jl. Egyptian Med. Assoc.* 1938. Feb. Vol. 21. No. 2. pp. 45–56.

A death from fouadin with findings and conclusions.

A child of 9 infected with *S. haematobium* died collapsed after his eighth intramuscular injection of fouadin, having by then received 13·25 cc., or about 0·15 gm. of antimony. His liver contained as much antimony as had been given in the last three injections, and his death may safely be attributed to accumulation of antimony in the liver. In fact fouadin has proved as deadly as tartar emetic, and as KHALIL estimates [this *Bulletin*, 1936, Vol. 33, p. 957] antimony given for schistosomiasis kills about 2,000 persons in Egypt yearly. In the paper quoted, Khalil advocated "A practical method for detecting the schistosomiasis cases with idiosyncrasy to antimony to avoid fatalities and complications." With its practicability Diamantis disagrees. The method is a colour test to measure the amount of the pyrocatechin (with which antimony is combined in fouadin) which is excreted by the kidneys, and there seems to be a difference of opinion as to whether the proportion of pyrocatechin normally excreted by kidneys and bowel is constant. Then the great majority of cases of schistosomiasis treated with antimony in Egypt are not treated with fouadin, but with a tartrate which contains no pyrocatechin, so that this tolerance test is, as things are, capable of little use there. Moreover, should all cases in future be treated with fouadin, this would mean a million persons yearly with some ten injections each, and to carry out the tolerance test would be an impossible task. But that 2,000 persons should be killed yearly by antimony is monstrous, seeing that the infection would not have killed them in that time, and that had they kept certain rules they might have looked for natural cure. Eradication of schistosomiasis will never be got by treatment alone, yet treatment, when given, must be safe. The point is made that death has never been brought about by 4 antimony injections ; accordingly only 4 should be given, the adult dosage being :—3 cc. on days 1 and 3, 5 cc. on days 5 and 8. Thereafter the treatment is by emetine : day 11, 0·06 gm. ; day 12, 0·09 gm. ; days 15, 18 and 22, 0·12 gm. The total advocated dose of antimony is then about 0·18 gm. and of emetine 0·63 gm. with, if needed, one more dose, 0·12 gm. of the latter on day 27. Both drugs are thus, it is held, kept below dangerous amounts. *C. L.*

CAWSTON (F. Gordon). **Unsuccessful Attempts at curing Schistosomiasis by Oral Tablets.**—*Jl. Trop. Med. & Hyg.* 1938. Apr. 1. Vol. 41. No. 7. pp. 118–119.

Two cases were treated with cuprochin. The first, a lad of 18, weighing about 122 lb., received 78 tablets, or 1·8 gm., in 10 days ; a week later a clear urine contained many living ova ; he was then

given an antimony salt intravenously. The second, a native woman, had by the 18th day taken 240 tablets or about 4·5 gm., and was still passing living ova. *C. L.*

CAWSTON (F. Gordon). The Possibility of treating Schistosomiasis with Unguenta.—*Jl. Trop. Med. & Hyg.* 1938. Jan. 1. Vol. 41. No. 1. pp. 8–10.

——. The Cause and Treatment of Bilharzia Disease.—*South African Med. Jl.* 1938. Jan. 22. Vol. 12. No. 2. pp. 51–52.

WITENBERG (G.) & YOFE (J.). **Investigation on the Purification of Water with Respect to Schistosome Cercariae.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1938. Mar. 17. Vol. 31. No. 5. pp. 549–570. [13 refs.]

Chlorine is the only agent which can be depended upon in practice to kill schistosome cercariae, and chloramine is its most effective form.

Inquiries made in Alexandria, Cairo and Tanta by these visitors from Palestine brought out the Egyptian experience, covering many years, that those who lived in those cities do not get schistosomiasis provided they use only tap water for washing and drinking. Such water has undergone three processes since it left the Nile—precipitation by alum solution of a strength of 80 per million, filtration through standardized quartz sand, and chlorination either by a chlorine solution of 0·85 per million or by chloramine in a strength of 0·4 per million. The authors' laboratory tests of the values of these processes are as follows. Alum, alone or following lime, does not affect these cercariae, and the standard sand filtration does not keep them back. They also found that a pressure of 200 atmospheres for 6 hours did not injure them ; an alkaline reaction of 11·5 *p*H is indeed fatal but cannot be attained in the water treatment plant. Chlorine, it then is, which has protected the water users in these cities. As to its needed concentration, it rapidly disappears from the water for the first ten minutes after being added to it, probably being absorbed by organic matter living or dead, thereafter its amount falls slowly ; but in the experiments death has been postponed for as much as 1½ hours. Assuming that water will not come into use for 30 minutes after chlorination the concentration of the element in the water should be as follows according to the method by which it reaches the water : for gaseous chlorine the amount after 10 minutes should be 0·6 per million, for sodium hypochlorite 0·42 per million, for chloramine 0·22 per million. Instructions given for the preparation of chloramine solution are as follows :—

" ' Chlorine water ' containing about 2 grammes of chlorine per litre was prepared by introducing gaseous chlorine into the water. Two grammes of ammonium chloride (NH_4Cl) were dissolved in 100 cc. of this chlorine water and this solution was left to stand for about 2 hours at room temperature ; 2½ cc. of this solution dissolved in one litre of water formed the stock chloramine solution used in our experiments and it contained from one to two per million of active chlorine."

[In the text sodium hypochlorite is the term uniformly used, in two of the tables the substance is referred to as natr. hyperchlorid.]

C. L.

HUECK (O.) & WEN HUAN HUI. Zur Fuadinbehandlung bei *Opisthorchis sinensis*. [**Treatment by Fouadin of Infection with** *C. sinensis*.] —*Arch. f. Schiffs- u. Trop.-Hyg.* 1938. Jan. Vol. 42. No. 1. pp. 25–27.

Of 24 cases of this infection treated with 5 or more injections of fouadin, 10 became negative for ova, 13 remained positive and 1 died during the course. *C. L.*

ALICATA (Joseph E.) & SCHATTENBURG (O. Lee). **A Case of Intestinal Heterophyidiasis of Man in Hawaii.**—*Jl. Amer. Med. Assoc.* 1938. Apr. 2. Vol. 110. No. 14. pp. 1100–1101. With 1 fig.

The first case of heterophyid infection reported from Hawaii.

A Japanese lost weight with diarrhoea. There were small fluke eggs in the faeces. The giving of 6 gm. oleoresin of aspidium brought away several hundred flukes identified as *Stellantchasmus falcatus* [which has been found in cats and in man in Formosa and Okoyama ; the ova resemble those of *Clonorchis sinensis*]. The fresh water mullet, *Mugil cephalus*, was suspected as an intermediate host and in it were found metacercariae resembling the fluke, as many as 263 to the gram of muscle. When these were fed to cats heterophyid flukes developed, which are undescribed and the illustration given of one is not clear. *C. L.*

AFRICA (Candido M.), DE LEON (Walfrido) & GARCIA (Eusebio Y.). **Heterophyidiasis: V. Ova in the Spinal Cord of Man.**—*Philippine Jl. Sci.* 1937. Mar. Vol. 62. No. 3. pp. 393–399. With 2 plates (1 coloured).

A male Filipino, aged 44, was found dead in a Manila street. No clinical data could be got.

" B.Q., male Filipino, 44 years old, single, bricklayer, born in Batac, Ilocos Norte, but residing in Manila, was found dead in one of the streets of this city, May 18, 1936, and autopsied in the city morgue on the same day. No clinical data could be obtained from a brother who identified the cadaver. The following were the post-mortem findings : Hypertrophy and dilatation of the heart ; sclerosis of coronary vessels ; distention and congestion of lungs ; congestion of liver, spleen, and kidneys ; meningeal haemorrhage, basal extensive. Parasitological findings : Twenty-three adult specimens of *H. brevicaeca* and 11 *M. taihokui* were recovered from the scrapings of the small intestine ; sections of the myocardium taken from the apical region near the interventricular septum revealed extensive lesions with eggs typical of cardiac heterophyidiasis ; sections of the spinal cord in the lower and upper segments of the dorsal and lumbar cord respectively revealed islands of circumscribed, compact, specific reactive tissue and haemorrhagic areas punctuated with eggs at various levels of the damaged cord. Extensive search for similar lesions in the brain was unsuccessful." *C. L.*

AFRICA (Candido M.), DE LEON (Walfrido) & GARCIA (Eusebio Y.). **Heterophyidiasis : VI. Two More Cases of Heart Failure associated with the Presence of Eggs in Sclerosed Valves.**—*Jl. Philippine Islands Med. Assoc.* 1937. Oct. Vol. 17. No. 10. pp. 605–609. With 2 figs. on 1 plate.

Of the two cases mentioned in the title, heterophyid eggs were found in the heart muscle in one only, though the myocardial (reticulo-endothelial) lesions in the second were those which the writers

associate with the presence of these eggs there. The adults were found in the scrapings of the intestinal mucosa of both, and so were eggs in calcified areas of the mitral valves. *C. L.*

WANG (Shao-Hsun) & HSIEH (C. K.). **Roentgenologic Study of Paragonimiasis of Lungs.**—*Chinese Med. Jl.* 1937. Dec. Vol. 52. No. 6. pp. 829–842. With 10 figs.

"From the study of six human cases and one experimental animal of paragonimiasis of the lung, together with a review of Yamata's report, we are convinced that roentgenologic examination may demonstrate characteristic findings. The lesions are presented on the roentgenogram of the chest as single or multiple, fairly well circumscribed, usually isolated patches of infiltration situated in various parts of the lung field. These shadows of infiltration, we believe, are the direct evidence of paragonimus infestation and therefore of definite diagnostic value."

"The roentgenologic examination can only offer presumptive evidence of the disease. In an endemic area the roentgenologic examination may give confirmatory findings, while in regions where the intermediate host is not present roentgenologic study may lead to the discovery of migrated cases of paragonimiasis. When isolated patches of infiltration are present in the roentgenograms, especially in cases of which the history is atypical of pulmonary tuberculosis and the sputum is negative for tubercle bacilli, the possibility of paragonimiasis should always be considered, even though the sputum may not show any ova of the parasite, as in cases where the parasites may have died, but still have left damages in the lungs."

C. L.

KELLER. Sur une nouvelle méthode de traitement de la sparganose oculaire. [**A New Way to treat Ocular [Orbital] Sparganum Infection.**]—*Ann. de l'École Supérieure de Méd. et de Pharm. Indochine.* 1935–1937. Vol. 1. pp. 77–89. With 4 figs on 2 plates.

The number of cases of orbital sparganosis which Keller [this *Bulletin*, 1938, Vol. 35, p. 223] has now treated with novarsenobenzol, given intravenously with satisfying results, is 12. They are here described in detail. The dosage should be kept to its adequate minimum, namely 30 mgm. to 45 mgm. for an adult, an amount which may be repeated in 4 or 5 days. *C. L.*

DAMMIN (Gustave J.). **The Rapid Preparation of Tapeworm Proglottids for Diagnostic and Teaching Purposes.**—*Jl. Lab. & Clin. Med.* 1937. Nov. Vol. 23. No. 2. pp. 192–194.

The preparation noted in the title is put through thus with the object of making clear the outlines of the uterus.

About 5 cm. of strobile containing gravid proglottids is held between 2 slides by elastic bands, immersed for 10 to 12 hours in saturated watery picric acid solution 70, glacial acetic acid 20, formalin 10. Apparently the slides are then separated and the proglottids washed in running tap water for 2 to 3 minutes, flooded when in a horizontal position with 10 per cent. caustic soda solution, and closely watched so that when the peripheral part fades the ova are still a deep orange colour and so mark out the shape of the uterus. Rinsing, flooding with 5 per cent. hydrochloric acid, replacing in tap water for 15 minutes, bringing up slowly through stronger alcohols to a solution of

95 per cent., clearing in xylene and mounting in gum dammar complete the process. An explanation of the staining reaction in chemical terms is suggested. *C. L.*

SAMI (M. A.). **Hydatid Disease in the Punjab.**—*Indian Med. Gaz.* 1938. Feb. Vol. 73. No. 2. pp. 90–94.

"The object of this note is to draw attention to the relatively high incidence of hydatid disease in the south-western portion of the Punjab, a fact that has not been previously recognized."

In 26 cases there was operative opening or excision of a cyst, in one an autopsy. Diagnosis in all cases was by appearance to the naked eye. In 11 the presence of daughter cysts is reported, one of them being under the pectoralis minor and bursting into the axilla; in one, under the latissimus dorsi, the evidence for hydatid was the finding of degenerating cyst wall; two patients are described as having exogenous cysts, one patient had besides "a cyst in the right lobe of the liver" another mass between rectus sheath and peritoneum described as consisting of "numerous exogenous cysts," the second is described as "an exogenous cyst lying under the trapezius muscle,"; a cyst on the lower surface of the liver was competely excised; one in the right hypochondrium, anchored to the abdominal wall and opening into another behind, was drained, there being no helminthic details; from another man 15 of a number of omental and mesenteric cysts were removed, others studding liver and spleen; one sprang from the site of the pancreas and contained clear fluid; a partially calcified cyst which contained a "white solid mass" was attached to the anterior abdominal wall; a calcified cyst was found at autopsy in a spleen which had been more or less shot away; a cyst, undescribed, was attached to the upper and posterior surface of the bladder; one in the right breast was "found to be a hydatid"; two in the neck are undetailed; the same holds for two on the forehead, while one over the left parietal bone is described as a typical single hydatid cyst. Race seemed to have had no effect on incidence. Locally there is about 1 dog to 10 human beings and of 156 dogs examined there was *Echinococcus granulosus* in 45 numbering from a few to many thousands. Infection rate among herbivores was 1 per cent. in sheep and goats, and 150 of 168 cattle; the village dog is a fine scavenger of offal. *C. L.*

DUNGAL (Niels). Echinokokkus des Herzens. [**Hydatid of the Heart.**] —*Acta Path. et Microb. Scandinavica.* 1938. Vol. 15. No. 1. pp. 90–100. With 3 figs. [12 refs.]

"In a 39 year old female, dying of carcinoma of the stomach, a hydatid cyst was found at autopsy in the left ventricle of the heart with perforation into the pericardium which contained 400 cc. of hydatid fluid and ruptured secondary cysts. About 16 months before death the patient had a sudden attack of fever followed by great dyspnoea, these symptoms probably indicating the date of rupture. At autopsy an open foramen ovale was found, and it is suggested that the hexacanth embryo may by this route reach the coronary arteries in cases of hydatid infestation of the heart. The pathogenesis and consequences of hydatid cysts of the heart are discussed."

C. L.

DE WAELE (A.) & DE COOMAN (E.). Etude expérimentale de l'echinococcose secondaire. [**Experimental Study of Secondary Hydatid Infection.**]—*Ann. Parasit. Humaine et Comparée.* 1938. Mar. 1. Vol. 16. No. 2. pp. 121–132. [15 refs.]

The hydatid of Belgian Flanders is mainly in the horse, and is unilocular, sometimes multilocular, never alveolar.

There are rarely daughter cysts. In white mice intraperitoneal injection is always successful, subcutaneous sometimes so; in the rabbit there was no infection; white rats may be infected subcutaneously, black rats are refractory. These transfers are then quite different from the findings of DÉVÉ in hydatid cysts of the sheep. Tracheal inoculation was unsuccessful in mouse, rat and rabbit.

C. L.

PENFOLD (W. J.), PENFOLD (H. Boyd) & PHILLIPS (Mary). **Artificial Hatching of** *Taenia saginata* **Ova.**—*Med. Jl. Australia.* 1937. Dec. 11. 24th Year. Vol. 2. No. 24. pp. 1039–1042.

It is believed that no one has hitherto attempted to hatch artificially the embryos of this parasite.

For successful hatching, artificial duodenal must follow artificial gastric digestion. With 1 per cent. pepsin and 0·4 per cent. hydrochloric acid the eggs must be in this for 4 hours before being acted on by a pancreatic juice with 0·6 per cent. of pancreatin. If the strength of both ferments is doubled, two hours in gastric juice is followed by almost immediate hatching in pancreatic juice. Hatching from the radially striped embryophore is entirely a matter of digestion, the rod shaped elements falling apart and freeing the embryo whether it is dead or alive. If the outer delicate membrane has not been lost, it is the living embryo's own activity which frees it from this.

C. L.

KRAYER (Otto). Kürbissamen als Bandwurmmittel. [**Pumpkin Seeds in the Treatment of Tapeworms.**]—*Klin. Woch.* 1937. Nov. 20. Vol. 16. No. 47. pp. 1651–1652. With 1 fig.

Pumpkin seeds do not kill tapeworms, but followed by a saline purge they bring them away.

The doses hitherto used are too small. To be effective they must amount to as much as 700 gm. for an adult. This may either be mixed with honey or stewed fruit and so got down; or a watery extract may be made by cooking with twice the quantity of water till a mush is formed, in about 1½ hours, which is strained through cloth and the liquid extract given. The seeds contain about 30 per cent. of oil which is not the active principle. In 5 human cases reported no tapeworm heads were recovered, but 2 years later no more segments had been passed. *C. L.*

ERCHOV (V. S.) & MALYGUINE (S. A.). Un cas de moniezia sp. observé chez l'homme. [**A** *Moniezia* **in Man.**]—*Med. Parasit. & Parasitic Dis.* Moscow. 1937. Vol. 6. No. 5. [In Japanese pp. 627–629. With 2 figs. French summary p. 629.]

The species was not determined, but it is said that there were certain symptoms which disappeared on the expulsion of the moniezia.

C. L.

ZIMMERMANN (Helen Ruth). **Life-History Studies on Cestodes of the Genus Dipylidium from the Dog.**—*Ztschr. f. Parasitenk.* 1937. Dec. 9. Vol. 9. No. 6. pp. 717–729. With 6 figs. [12 refs.]

Trichodectes canis is probably not the intermediate host of *Dipylidium caninum.*

About 3,000 of these dog lice were dissected, more than 2,000 of them having been fed on gravid proglottids of *D. caninum.* The larval stages which occur in them differ from those found in the dog flea *Ctenocephalus canis.* It is suggested that while the latter is that of *D. caninum* the former is that of *D. sexcoronatum.* *C. L.*

MEDICAL AND SANITARY REPORTS.

PALESTINE (1936).

Palestine, on the western edge of the continent of Asia at the eastern extremity of the Mediterranean Sea, is bounded by the Mediterranean on the west, Syria on the north, Trans-Jordan on the east and the Egyptian Frontier District of Sinai on the south. It has a total area of about 10,100 sq. miles (somewhat larger than that of Wales). The chief town and seat of government is Jerusalem ; other important towns are Gaza, Tel-Aviv, Acre, Jaffa and Haifa, the last two being also the chief ports. Palestine is administered under a Mandate from the League of Nations.

Vital Statistics.—Including the Bedu tribes as enumerated at the 1931 census, the mid-year population for 1936 was estimated to total 1,339,012 persons, distributed as to 848,354 *Moslems*, 370,475 *Jews*, 108,964 *Christians* and 11,219 others. For the *settled population only* (excluding the Bedu tribes) the relevant facts may be classified as follows :—

Community	Mid-Year Population	Births	Birth Rate	Deaths	Death Rate	Infant Deaths	I.M.R. per 1,000 births
Moslems ...	781,789	41,543	53·1	15,624	20·0	5,657	136·2
Jews ...	370,471	11,009	29·7	3,271	8·8	758	68·9
Christians...	106,473	3,869	36·3	1,345	12·6	440	113·7
Others ...	11,219	572	51·0	225	20·1	74	129·4
Totals ...	1,269,952	56,993	44·9	20,465	16·1	6,929	121·6

Of the total deaths recorded 8,518 were certified as to cause of death by Medical Practitioners, and of these 22 per cent. were due to *respiratory affections*, 26 per cent. to *diarrhoea and enteritis*, and 9 per cent. to *infectious and parasitic diseases*.

Maternity and Child Welfare Work.—To the Princess Mary Maternity Wards at the Government Hospital, Jerusalem, 625 maternity cases were admitted, 602 live babies were born, and 5 maternal deaths were recorded. To the Haifa and Nablus Government Hospitals maternity cases admitted during the year were 184 and 56 respectively.

The appointment of two British Lady Medical Officers permitted the extension of gynaecological and ante-natal services, especially amongst Moslem women. Such clinics are established at Jerusalem, Jaffa, Haifa, Acre, and Nablus, and at these centres despite disturbed conditions the large attendances testify to the value of the services available.

The Medical Department conducts 32 *Infant Welfare Centres* in towns and villages—four new village centres being opened during the year under review. Voluntary Committees co-operate in association with five of the centres, and in four others Municipalities participate in the cost of maintenance. Government contributes to the support of the maintenance of the infant welfare services conducted by the Jewish Medical Organization. Summarizing the records of work

relating to the various authorities conducting infant welfare services, the following facts are of interest :—

Supporting Organization	No. of Centres	Children Registered	Attendances Children	House Visits by Nurses
Government and Municipal ...	34	9,344	251,134	84,198
Hadassah Medical Organisation	15	2,692	56,711	19,414
Jewish Federation of Labour	19	2,149	34,494	2,724
Women's International Zionist	5	484	17,729	2,138
Local Committees	4	1,082	27,620	7,867
Totals ...	77	15,751	387,688	116,341

The only *Midwife Training School* is established at the Government Hospital, Jerusalem (Princess Mary Maternity Wards). During the year 16 Midwives completed the course of training. Plans to establish training schools at the Nablus and Jaffa Hospitals had to be postponed for financial reasons. The supervision of practising midwives and the development of district maternity and infant welfare services is carried out by the Superintendents of Midwifery stationed at Jerusalem, Jaffa, Haifa, Nablus, Gaza, and Hebron.

School Hygiene.—The appointment of additional medical officers and nurses not being approved the work was carried on as satisfactorily as possible with existing staff. The Government School Medical Service is responsible for 378 boys' schools, 56 girls' schools and 25 mixed schools having a student population of 46,688 distributed as to 35,532 boys and 11,156 girls. The routine examinations of new entrants continued to be carried out as previously described (see this *Bulletin*, 1936, Supp., p. 103* and 1937, Supp., p. 112*). During the year 9,826 pupils attending town schools and 10,395 pupils attending village schools were medically examined when it was found that 41·6 per cent. of those in town schools and 55·6 per cent. in village schools were suffering from *trachoma*, while attendances for routine treatment of the disease by teachers and school nurses totalled no less than 1,856,250. The usual examination of school-children for presence of splenic enlargement was carried out, 24,012 children attending town schools and 42,029 children in village schools being dealt with ; spleen rates in the former averaged 1·7 per cent. and in the latter 6·7 per cent. It is noted there are also 347 Jewish Schools having 50,621 children on the registers, dealt with by the Jewish Medical Service, and 360 schools not provided for by Government or Jewish Medical Services and having 30,478 pupils on their books. During the year 23 lectures on hygiene, etc., were given by the Medical Officers to Teachers who recorded 206 attendances on such occasions. In the case of Girls' Schools the older girls receive training in mothercraft and infant welfare under the direction of the Superintendents of Midwifery and Infant Welfare Nurses.

Public Health, Sanitation, etc.—In spite of serious disturbances and general unrest which combined to hamper the work of the Medical Department, especially in rural areas where staffs were exposed to constant dangers, services were well maintained, and the general health of the population at large was remarkably satisfactory. It is reported that the standard of *household sanitation and drainage* in the main

towns was well maintained, latrine and bath installations in both Arab and Jewish quarters being of the most modern type. The completion of the intercepting *sewer* in the reconstructed port area of Jaffa is mentioned (see this *Bulletin*, 1937, Supp., p. 113*), but it is said that though in Jerusalem a decision to extend sewer connexions was reached, no great progress in the actual work can be recorded. The Consulting Engineers have in hand schemes applicable to Haifa, Jaffa, and Tel-Aviv. Despite all difficulties the work of installing *latrines* in villages—mainly in areas where the incidence of hookworm is high—was carried on practically without interruption; in 45 villages 4,708 latrines were installed. The Municipal Sanitary Services already overtaxed (see this *Bulletin* 1937. Supp., p. 113*) were operated under exceptional difficulties owing to the civil disturbances. In the smaller towns *scavenging* was reasonably satisfactory, though methods of disposal are primitive, but in the villages this work makes but slow progress.

The new *water supply* for Jerusalem from Ras-el-Ain was brought into use (see this *Bulletin*, 1937, Supp., p. 112*), but as the softening and filtration plant was not completed purification was effected by chloramine added to the supply at the last pumping station before the reservoirs, and the purity of the supply maintained at a high level throughout the year. Little advance is reported as regards other municipal supplies. The Consulting Engineers have reached no definite proposals with regard to additional supplies to Jaffa and Tel-Aviv; investigations continue in the matter of the Haifa supply. Though the programme for the improvement of existing *village water supplies* was considerably hampered, a number of schemes have been completed and have provided comparatively adequate and pure supplies in areas where previously water was drawn under insanitary conditions.

Only a comparatively small programme of major schemes of *anti-malarial work* was possible during 1936, no new works were undertaken and activities were restricted to the improvement and completion of existing works which included those of Birket Ramadam, Rubin March, Tel-el-Rish and Tiberias Lake Shore.

A scheme for the *housing of labourers* who live in shacks under appalling conditions in and around Haifa has been prepared, and one similar for Jaffa. Work involved under the Public Health (*Rules as to Food*) Ordinance was to some extent disorganized by the prolonged strike when all Arab establishments were closed. Special attention was devoted to the inspection of milk and butter and of fish brought by the desert route from Baghdad. The inspection and licensing of premises was continued.

The Staff of the *Railway Medical Service* remained unchanged and continued to carry out routine work as in previous years. The housing programme (see this *Bulletin*, 1937, Supp., p. 114*) was almost completely stopped on account of political disturbances and little progress can be reported. Total attendances of railway personnel at the clinics of Medical Officers were 18,140 and of these 13,261 were new cases.

Port Health Work.—Quarantine restrictions were imposed at various times against cholera for arrivals from India, Siam, and Ceylon, plague for arrivals from Malta and India, and smallpox against arrivals from India. During the year 1,957 steamers and 551 sailing vessels entered the port of Haifa, 48,204 persons disembarked and were notified for surveillance, 22,008 of these being immigrants who

were medically examined, etc., before being allowed to enter the country. The port of Jaffa was closed during practically the whole period of the Arab strike with the result that only 603 steamers and 273 sailing vessels entered; 8,845 persons disembarked and of these 4,523 were immigrants who were dealt with as at Haifa. Rat catching at the ports was continued but on examination none showed any signs of plague.

Of the total of 57,717 persons entering the country during the year and subjected to medical surveillance, 95 per cent. were traced to their destinations; 784 Palestinians and Transjordanians made the pilgrimage to Mecca, returning pilgrims being subjected to medical surveillance in accordance with usual practice.

Air traffic becomes increasingly important; 462 aeroplanes landed at Gaza, 381 at Ramleh and 59 at Haifa. Concentration of traffic at Lydda airport will greatly simplify quarantine work of these services.

Hospitals, Dispensaries, etc.—New construction of buildings was entirely suspended; there was no advance in the work on the proposed new Mental Hospital (see this *Bulletin*, 1937, Supp., p. 115*), the provision of a Tuberculosis Sanatorium Hospital (see this *Bulletin*, 1937, Supp., p. 117*), the expansion of Nablus and Safad Hospitals and construction of the Ramleh Hospital, the new Infectious Diseases Hospital at Jerusalem (see this *Bulletin*, 1937, Supp., p. 114*) or the Maternity Block at Jaffa. There was therefore no expansion of hospital bed accommodation to meet increasing needs, the British section was especially overcrowded and the amount of surgical work both among in- and out-patients at Government Hospitals increased considerably owing to the admission of the large number of severe cases among Army and R.A.F. personnel wounded during the political disturbances.

The record of work at all institutions during 1936 reads as follows :—

Description	Beds	Admissions					Deaths
		Moslems	Jews	Christians	Others	Total	
9 Government and Municipal Hospitals	844	7,724	8,552	2,409	129	18,814	1,263
4 Prison Wards ...	72	1,003	142	70	13	1,228	1
29 Voluntary Hospitals	1,895	7,894	15,468	4,338	1,729	29,479	1,214

The accommodation at various hospitals is acutely inadequate and expansion is urgently necessary. The greatly augmented number of British troops and continued presence of ships of the Royal Navy, for whom adequate military hospital accommodation was not arranged before August, threw a considerable amount of extra work upon already over-taxed staffs and hospital accommodation.

Exclusive of ophthalmic and other special clinics, there are 20 Government and Municipal *dispensaries and out-patient clinics* where during the year under review 139,968 new cases were treated, *eye diseases* accounting for 7,556 and *malaria* for 1,158 of the total patients, among whom 72 per cent. were Moslems and 17 per cent. Jews.

At the 41 *voluntary dispensaries and clinics* 625,248 new cases were dealt with, over 80 per cent. of the patients were Jews and only 14 per cent. Moslems; here again *eye diseases* with 106,762 cases were

responsible for much disability, while *malaria* was treated in 2,923 patients.

Voluntary village clinics dealt with 267,911 new cases, the majority being Jewish patients, *viz.*, 257,346 ; *eye diseases* accounted for 11,626 and *malaria* for 1,727 of the total cases.

The training of nurses was continued, 53 first year, 44 second year, and 32 third year nurses succeeded in passing the respective grade examinations.

The two *Government Mental Hospitals* at Bethlehem were constantly full, few new cases could be admitted, and there is a waiting list of some 179 cases. Admissions numbered 33, deaths 3, and at the end of the year there were 157 patients in these institutions. *The Ezrath Nashin Hospital for Jewish paying cases* admitted 24 patients, two died and there were 58 in-patients at the end of the year.

The special ophthalmic service, the ophthalmic sections of the general clinics at Government hospitals and dispensaries, and the Mobile Ophthalmic Unit continued to be actively employed throughout the year. The epidemic of acute conjunctivitis was of a milder type and attended with fewer complications (see this *Bulletin*, 1936, Supp., p. 106*, and 1937, Supp., p. 115*). New cases were very slightly fewer than in the preceding year, *viz.*, 63,480 as compared with 64,745 ; an increase in the total of attendances for treatment was recorded. As regards eye conditions dealt with these included 43,954 cases of *trachoma*, 5,346 of *trachoma with corneal ulceration*, and 27,689 of *acute conjunctivitis*.

Reported cases of *infectious diseases* numbered 10,960 with 1,168 deaths ; *measles* accounted for 3,489 cases and 199 deaths, and *typhoid and paratyphoid fever* for 1,318 cases with 146 deaths. The Report under review discusses at varying lengths the principal items of morbidity experience during 1936 ; summarized notes of some of the commentaries follow hereafter.

The incidence of *malaria* is said to have been low in rural, and negligible in urban areas. Actually there was a slight increase in the number of cases of the disease treated at public dispensaries, but taking into consideration the total number of patients treated for all causes of ill-health the percentage of malaria patients was lower ; among 765,216 dispensary patients dealt with 4,081 were treated for malaria. There is no reference to the total of malaria patients treated in the various hospitals but 840 cases were notified and these involved 4 deaths ; one non-fatal case of *blackwater fever* was recorded. Anti-malaria services in both urban and rural areas continued to be actively employed mainly on measures of a recurrent nature and on the maintenance of major works already completed (see above *Public Health* and this *Bulletin*, 1937, Supp., p. 115*). A favourable influence was the failure of the rains in late spring, facilitating the drying-up of temporary collections of water and swampy ground before the commencement of the anopheline breeding season. The disturbed political situation rendered the regular supervision of mosquito breeding places a matter of no little danger and difficulty, yet a considerable amount of valuable work was successfully accomplished ; the anti-malaria statistics are supplied in great detail in a series of tables. The examination of school-children for presence of splenic enlargement has already been briefly mentioned in the section *School Hygiene* above.

At the Government Laboratory where 11,500 blood films were examined for the presence of malaria parasites 911 proved positive,

and of these 77·2 per cent. were *benign tertian*, 21·9 per cent. *subtertian* and 0·9 per cent. *quartan* infections. In the Entomological Division work during the year was confined to the routine identification and classification of insects of medical importance—mainly anophelines in their larval and adult stages.

No case of *smallpox* was reported. Vaccinations in the villages were somewhat fewer during the summer owing to disturbed conditions; 77,960 vaccinations were performed during the year. The incidence of *cerebrospinal meningitis* declined by comparison with 1935 experience; 107 cases with 52 deaths were recorded. Cases of *acute poliomyelitis* continued to occur sporadically in small numbers, 21 cases and 5 deaths being ascribed to this cause. Of *relapsing fever* 23 non-fatal cases occurred. The incidence of *measles* showed little change with 3,489 cases and 199 deaths; there were, however, fewer cases and deaths due to *diphtheria*—257 and 26 respectively, while of *scarlet fever* 197 non-fatal cases were reported.

Typhus fever was responsible for 280 cases and 2 deaths as compared with 55 cases with 3 deaths in the preceding year, the increase being largely attributed to housing conditions and overcrowding following upon increased immigration. At the Government Laboratory research work on the endemic typhus of Palestine was carried out during the summer months; investigations confirm the view that the disease is not epidemic but murine typhus, a conclusion supported by the mildness of cases and a low case-mortality rate.

The incidence of *enteric fever* was about half that of 1935; of the 1,318 cases and 146 deaths recorded, 1,148 of the cases and 143 of the deaths were ascribed to typhoid and the remainder to paratyphoid fever. No particular factor or group of factors can at present be held to have contributed to the decline—political disturbances restricted population movements in some areas, yet the decline was as marked in areas where such restrictions were scarcely felt; a shortage of green vegetables may have been a factor. Some time must elapse before any definite conclusions can be reached.

At the laboratory the agglutinin content of 21,645 samples of sera was evaluated, among the positive reactions being 890 *Bact. typhosum*, 82 *Bact. paratyphosum A*, 152 *Bact. paratyphosum B*, and 10 *Bact. paratyphosum C*. From 5,120 blood samples received for blood culture *Bact. typhosum* was recovered 252 times, *Bact. paratyphosum A* 25 times, and *B*, 26 times. Enquiry into the prophylactic power of anti-enterica vaccines containing appreciable quantities of Vi antigen was continued; results seem to establish that no mutual relation existed between the type of vaccine used and the titre of Vi agglutinin evoked.

Bearing in mind that notification of *Dysentery* is still incomplete, it is said that during 1935 the disease was not unusually prevalent, that 585 cases were reported and 39 deaths were ascribed to this cause. At the Laboratory findings resulting from the microscopical examination of 20,321 faecal specimens included *E. histolytica* (free) 279, *E. histolytica* (cysts) 359, while resulting from 9,780 cultural examinations *Bact. dysenteriae*, Flexner-Y, was isolated 449 times, Shiga 100 times, Strong 86, Schmitz 63 and *Bact. dysenteriae* Sonne 28 times.

Tuberculosis.—Little was done during 1935 to relieve the existing situation, palliative treatment only was possible except in a few cases, for the State tuberculosis service envisaged was not sanctioned (see this *Bulletin*, 1937, Supp., pp. 116*–117*). Apart from the 4,592 cases discovered during the course of the survey (mentioned in these pages

a year ago) it is stated that during the year 438 cases and 201 deaths were reported. In another section of the Report 786 cases and 185 deaths are classified and of these 397 and 141 deaths occurred in towns and the remainder in the villages ; among them 351 of the town cases and 118 of the deaths were ascribed to the *pulmonary* form of the disease, the corresponding figures for the villages being 327 and 35 respectively.

At the Government Clinics established for the treatment of tuberculosis 514 cases were on the registers, but as the Jewish Tuberculosis League caters for the Jewish section of the population these figures are mainly representative of the Arab community ; the Jewish League recorded 2,233 cases. Among 4,674 specimens of sputum examined microscopically at the Government Laboratory 542 were found to contain *Myco. tuberculosis.*

Notification of *pneumonia* is still incomplete ; during the year 531 cases and 386 deaths were reported.

Helminthiasis.—In the orange growing areas *hookworm* continued to be prevalent (see this *Bulletin,* 1937, Supp., p. 117*). The re-survey of the Jaffa district though hampered and disturbed by political conditions was continued, and 2,968 examinations were carried out : the percentage incidence among the untreated was 32·4 and among those previously treated only 7·8 per cent. Though village sanitation was continued satisfactorily it was found impossible to inaugurate the Department's scheme for the sanitation of the orange groves, though it is hoped this work will be undertaken in 1937. An investigation into the incidence of *schistosomiasis* in the Auja River Basin (Jaffa District) was commenced, but available figures are too small to be of value at present ; 64 cases of the disease (*S. haematobium*) were investigated in this area. The majority give a history of having bathed in the Auja River, though the molluscan hosts have not yet been identified. The investigation continues. At the Laboratory where Microscopic examinations of urine totalled 45,154, ova of *S. haematobium* were discovered in 49 cases and *S. mansoni* in 7 : the latter organism was also found 22 times in 20,321 faecal specimens, other findings including *ascaris* 895 times, *trichuris* 1,597, *taenia* 193, *ankylostome* 179.

Seven new cases of *leprosy* were reported and 4 deaths were ascribed to this cause during the year. Among 11,163 pharyngeal swabs examined at the Government Laboratory, *Myco. leprae* was found in 16 cases undergoing treatment in the Moravian Institute, Jerusalem.

Venereal Diseases.—At the principal centres of population where the Clinics for men and women continued to function with success (see this *Bulletin,* 1937, Supp., p. 117*), considerable advance is reported in the treatment of these diseases. The appointment of a specialist Medical Officer enabled more systematic attention to be devoted to the problem of venereal disease, and the treatment of endemic syphilis or "*Firjal*" was conducted on better organized lines for the highly infected population in Hebron and sub-district ; by mass examination of whole villages successively and treatment of all Wassermann-positive cases, it is hoped this endemic syphilis may be completely eradicated. The record of work shows 9,729 attendances at treatment centres as compared with 3,980 in the preceding year, while during the year 560 cases of *syphilis* and 81 of *gonorrhoea* were notified. Blood samples received at the Laboratory for examination

numbered 8,240 and of these 937 proved positive by the Wassermann and 1,143 by precipitation tests, while of 2,282 urethral and vaginal discharges examined microscopically 254 contained *N. gonorrhoeae.*

Among *other diseases* mentioned in the Report, it is noted that three deaths were ascribed to *rabies*, two of these occurring among untreated persons who had been bitten. At the 38 provincial centres supplied with the Department's anti-rabic vaccine 1,808 bitten persons were treated, though in 458 cases treatment was discontinued after 10 days as the biting animal remained alive and well; among the remaining 1,350 cases treated only one death occurred, symptoms of the disease appearing more than 15 days after the completion of treatment. Of 71 brains from suspected rabid animals examined at the laboratory 25 contained Negri bodies. The Laboratory Report contains a detailed account of the anti-rabies institutes and treatment centres, results of treatments, measures of control, etc. *Tetanus* was responsible for 41 cases and 26 deaths; *erysipelas* for 243 cases and 28 deaths; *whooping cough* 667 cases and 11 deaths; *influenza* 234 cases, 3 deaths.

Scientific.—The fully equipped Central Laboratories of the Department are situated in Jerusalem, and there are also branch laboratories established at Haifa and Jaffa. The Department exercises supervisory control over other laboratories and scientific institutes maintained by private funds. Anticipated additions to personnel and special equipment were not realized owing to the civil disturbances and their adverse effects upon budgetary estimates, yet the volume of work dealt with by the Bacteriological Division again showed an increase; 253,017 specimens were received for examination, and in addition large supplies of prophylactic and curative vaccines, etc., were prepared. The principal specimens received and findings recorded have already been the subject of brief reference in the preceding notes. It remains to say that though disturbed conditions combined to hamper research and epidemiological investigation, much useful work was continued; these enquiries included work on the *endemic typhus* of Palestine, the degree of virulence possessed by positive cultures of *C. diphtheriae*, the prophylactic power of variously prepared *anti-enterica* vaccines, etc. The work of the *Entomological Division* during the year was referred to in the notes on *malaria* above. In the *Chemical Division* 9,188 samples were examined as compared with 11,194 in the preceding year, the decrease being attributed to curtailment of sampling and diminished industrial activities consequent upon the civil unrest. Special investigations were carried out in connexion with local soils in the citrus belt; the following scientific papers were published:—

PUFFELES (M.). The problem of chlorosis in citrus trees.—"*Hassadeh.*" Vol. 16. No. 6.

——. On the cause of chlorosis in a mulberry tree.—"*Hassadeh.*" Vol. 16. No. 10.

——. A preliminary survey of some soils of the Jordan Valley.—"*Hadar.*" Vol. 9. Nos. 9 and 10.

BAKER (G. W.). Electrolytic application of the hydrobromine test for copper.—"*Analyst.*" 1936. 726. 603.

Financial.—Estimated expenditure on Medical Department Services for the financial year April 1st, 1936, to March 31st, 1937, amounts to £P.242,831 a sum which represents 3·9 per cent. of the total expenditure of the Palestine Government during the same

period. [It is noted that in the preceding issue of this Supplement expenditure was recorded as £3.211,062 whereas it should have read £P.211,062, the letter " P " (Palestinian pounds) having been replaced by an incorrect " 3."] *P. Granville Edge.*

CYPRUS (1936).

Cyprus, an island in the eastern Mediterranean, lies some 40 miles south of Asia Minor, 60 miles west of Syria and 240 miles north of Egypt. Its area is 3,584 square miles (about that of Norfolk and Suffolk combined). Nicosia, its capital, lies near the centre of the island.

Vital Statistics.—The relevant facts are set out below :—

Area	Estimated Population	Birth Rate	Death Rate	Infant Mortality Rate
(a) *The Colony*	367,216	34·3	12·4	105·2
(b) *Districts*—				
Nicosia	118,409	32.9	11·9	87·0
Larnaca	47,977	32·1	11·1	90·6
Limassol	59,654	36·2	14·6	132·8
Famagusta	75,464	37·1	11·3	103·8
Paphos	44,514	35·2	15·8	132·5
Kyrenia	23,198	35·9	13·4	89·8
(c) *Principal Towns*—				
Nicosia	26,312	27·0	12·4	68·3
Larnaca	12,960	25·0	14·8	113·8
Limassol	16,406	29·1	13·6	104·5
Famagusta	11,531	25·9	8·4	107·0
Paphos	4,724	18·4	13·5	114·9
Kyrenia	2,256	49·2	14·1	54·0

European Officials resident numbered 114 with an average number resident of 76 ; no invalidings or deaths were recorded. There were 1,836 resident *Cypriot Officials* with an average number resident of 1,780. Twenty were invalided and 12 died during the year.

Maternity and Child Welfare Work.—According to Hospital Returns, 552 labour cases were dealt with at the six hospitals, and of this total 234 were recorded in the Nicosia Hospital Maternity Wards with 236 births and 2 maternal deaths. The training of midwives under the direction of Dr. H. Symeonides was continued ; 15 pupils were successful at the local examination, and 15 commenced the course of training during the year. Government midwives and their pupils attended 294 confinements during 1936.

The Child Welfare Clinics continued to function with success in four of the principal towns with a steady increase in the volume of work. The new building referred to in these notes a year ago was completed and brought into use. The Child Welfare Associations held local Baby Shows in their respective towns and the Annual Baby Show and Health Exhibition organized by the Medical Department in co-operation with these Associations was successfully staged at Larnaca.

School Hygiene.—The combined and continued efforts of Medical Officers and of the Director of Education and his staff, succeeded in maintaining the improvements previously commented upon (see this *Bulletin*, 1937, Supp., p. 122*). Teachers are said to be taking greater interest in the sanitation of their schools and welfare of their pupils. Latrines are being provided in increasing numbers, and instruction in personal and general hygiene regularly taught. The Honorary Dentist in charge of Dental Clinics reports an increase in school dental work. During the year 338 schools were visited, 13,991 pupils examined and oral treatment given where necessary. In the Nicosia-Kyrenia Districts 76 per cent. of the 6,549 children examined had defective teeth.

Public Health, Sanitation, etc.—A scheme providing for the reorganization of Medical Department services became effective on February 1st. The changes introduced are expected to produce increased efficiency and smoothness in the administration of all services. The scheme is described in detail in an Appendix to the Report under review. An important event during the year and one marking a distinct advance in rural health control was the passing of the new Public Health Village Law. This instrument provides for the strict control of village sanitation, regulation of village markets, etc. *Anti-malarial* work continued to be carried out intensively. Complete surveys were carried out by the International Health Division of the Rockefeller Foundation in marshy areas responsible for intensive *A. elutus* breeding (see also this *Bulletin*, 1937, Supp., p. 124*). The main difficulty in malaria control in Cyprus is, however, in dealing with streams and shallow pools, the breeding places of *A. superpictus*.

With regard to *sewage disposal*, it is said that though new houses often have water-carriage systems to septic tanks installed, frequent shortage of water so seriously impairs the efficiency of such installations, that an improved pattern of pit-latrine appears to be the only solution. Village sanitation has made little or no progress; the absence of latrines in rural areas is a causative factor in the numerous epidemics of typhoid reported in the Island. Again the only reference made to *water supplies* (see this *Bulletin*, 1937, Supp., p. 122*) appears to occur in the Government Laboratory Report where it is noted 72 samples of water (mostly from proposed new sources of supply) were examined and only 42 of them were found to be potable.

Though much has been done to improve *housing conditions* in the principal towns, much still remains to be accomplished if the mistakes of the past are to be corrected. The difficulty attending efforts to improve conditions are commented upon and special mention is made of the problem of overcrowding in mining areas and surrounding villages, and of the importance of providing better ventilation in village houses. Housing conditions in mining areas received special attention; a building programme of some magnitude is to be implemented by the Cyprus Mining Corporation.

The Sanitary Inspectors' School opened in November with 25 pupils; the course covers 5 months followed by 2 months' practical work. In addition arrangements exist for Sanitary Inspectors in outlying stations to attend refresher courses.

Recommendations made by the Director of Medical Services include the appointment of a Tuberculosis Officer, of a full-time Dental Officer,

provision of a training school for nurses, a travelling eye clinic, and an out-patient clinic and dispensary on Troödos.

Port Health Work.—During the year the Medical Staff visited 602 steamships and 531 sailing vessels arriving at Cyprus ports, and in addition examined 37 aeroplanes arriving in the Island.

Hospitals, Dispensaries, etc.—The work at Government Hospitals, both surgical and medical, is said to have increased to such an extent that beds were always occupied so that many cases seeking admission had to be refused daily. There are Government Hospitals in Nicosia and Limassol, and State-aided Hospitals in four other towns. Work at these institutions may be tabulated as follows :—

Hospital	Beds	In-patients	Deaths	Out-patients
Nicosia	108	1,885	94	29,422
Limassol	45	763	42	9,970
Larnaca	55	1,034	24	6,800
Famagusta	38	837	20	6,407
Paphos	28	557	26	4,200
Kyrenia	32	571	17	2,525

Work of construction on the new Nicosia Jubilee Hospital was started and certain sections were almost completed by the end of the year ; an illustration of the new building appears as a frontispiece to the Report under review. Various improvements were carried out to the Hospitals in Famagusta and Kyrenia and a new building for the accommodation of nurses was completed at the Paphos Hospital. The *Rural Hospitals* continue to do excellent work ; the Lysi Hospital approaches completion and a new hospital at Polis was to be opened during 1937.

There are *Dispensaries* attached to each of the Hospitals in the six principal towns, and 10 rural dispensaries established in various parts of the Island. At these centres 88,470 new and 87,631 old cases received treatment. The new system of *Mukhtars' Certificates* (see this *Bulletin*, 1937, Supp., p. 123*) resulted in the addition of nearly £2,000 to hospital revenues.

An excellent *Isolation Hospital* has been built by the Cyprus Mines Corporation.

The notes which follow briefly summarize more extended references and descriptions of morbidity experience contained in the Report under review.

Malaria not being a notifiable disease it is not possible to measure incidence in the Island with any degree of accuracy. Fewer cases were reported during 1936, namely 12,779, as compared with 17,917 in the preceding year, but malaria cases are said to have constituted no less than 75 per cent. of the total in- and out-patients suffering from communicable diseases during 1936. Among 536 hospital in-patients, *benign tertian* infections numbered 412, *subtertian* 87, *malaria cachexia* 36, and *quartan* one, the corresponding distribution among 12,228 out-patients being 9,392, 775, 1,630 and 431. There were also 15 non-fatal out-patient cases of *blackwater fever.*

Brief reference has already been made to the malaria control work carried out by the Department and the special surveys conducted by members of the International Health Division of the Rockefeller

Foundation (see *Public Health* above). As an Appendix to the Annual Report is presented a comprehensive account of the activities of the Rockefeller Foundation contributed by Drs. W. K STRATMAN-THOMAS, M. A. BARBER, and Mr. J. C. CARTER. This special report has been reviewed at length in this *Bulletin*, 1938, Vol. 35, p. 257. At the Government Laboratory where 511 blood films were examined 39 were positive with *P. falciparum* and 35 with *P. vivax*; it is added that as the majority of films for the routine examination for the presence of malaria parasites are not sent to the laboratory, these findings are no indication of the prevalence of the disease.

Enteric fever is said to be increasing with such steady persistence as to give rise to no little anxiety, the numerous outbreaks being attributed to the absence of latrines in rural areas (see *Public Health* above) where without exception the system of open yard latrine is the rule. During the year 667 cases were reported, a 21 per cent. increase over 1935 experience, and 44 deaths were ascribed to the disease. Hospital in-patients numbered 182 with 25 deaths; all were *Bact. typhosum* infections. Among 199 out-patients types of infection were 187 *Bact. typhosum*, 9 *Bact. paratyphosum A*, 1 *Bact. paratyphosum B* and 2 undefined. The Report supplies details of reported cases tabulated with distinction of sex, age, locality, and season. Temporary hospitals were established in villages where the disease occurred in epidemic form, and the usual routine precautions taken. T.A.B. inoculations were carried out on a large scale, but on account of the reaction it is stated a large number of persons refused to submit to a second inoculation. At the Laboratory where 721 specimens of sera were examined for the presence of the specific agglutinins of the enterica group, 292 proved positive to *Bact. typhosum*, 44 to *Bact. paratyphosum A*, and 25 to *Bact. paratyphosum B*.

The incidence of *dysentery* is said to have steadily declined since 1930; insanitary conditions, especially in rural areas, contribute to maintain the infection. During the year 51 cases were reported as compared with 133 in the preceding year. The disease appears to show a preference for the 0–5 age-group, but it is believed a considerable number of the cases reported among children at these ages were not real dysentery but the ordinary enteritis of the summer season. There were 10 non-fatal cases among hospital in-patients; type of infection was undefined. Among 30 out-patients 7 were suffering from the amoebic and 23 from the bacillary form of the disease. At the Laboratory where 70 faecal specimens were examined, the findings included one *E. histolytica*, one the cysts of *E. histolytica*, and one *Bact. dysenteriae* Flexner. It is stated that few parasites of the Shiga type have been observed and bacteriologically confirmed.

In one section of the Report it is stated that *cerebrospinal meningitis* made its appearance in July, the first case being reported from Famagusta District. In another place where cases are tabulated by District and month of occurrence, Famagusta is not mentioned, but one case was reported in Nicosia, and one in Limassol in September. In any case, between September and the end of the year 38 cases with 10 deaths [Hospital Returns record 43 cases] were reported from Nicosia, Limassol, and Paphos Districts. Routine activities were abandoned when cases were reported and all efforts were directed towards meeting the emergency. At the close of the year the epidemic was still in existence; a detailed report is to be submitted.

Diphtheria is said to have given rise to 31 cases, the majority of them occurring in the Nicosia District; 24 of the cases occurred in the 0–5 age-group, and 5 in the 5–10 group. Hospital Returns record 3 cases with 1 death among in-patients and 10 out-patient cases. No case of *smallpox* or *plague* occurred. During the year 11,939 anti-smallpox vaccinations were performed and anti-rat measures carried out at the principal ports. At the Laboratory 847 rat spleen smears were examined, all were negative for *Past. pestis.*

Tuberculosis.—The funds collected during the Silver Jubilee of the late King George V for the erection of a modern sanatorium for the care and treatment of cases of tuberculosis were augmented by a gift of £10,000 from the Colonial Development Fund. As soon as a suitable site has been selected constructional work will be commenced. Mr. D. N. Dimitrion has given £3,000 for the building and equipment of a Tuberculosis Dispensary at Larnaca; this building should be completed during 1937.

The Anti-Tuberculosis League is firmly established and actively engaged in the routine care of needy tuberculosis sufferers. The League magazine, *Cyprus Public Health*, which deals with the prevention of the disease, is distributed monthly to schools, etc. During the year the National Association for the Prevention of Tuberculosis donated £100 towards the cost of establishing a tuberculosis dispensary at Nicosia, and also arranged for Dr. N. D. Bardswell, a recognized authority on the disease, and Nurse Jays to visit the Island, and co-operate with the Medical Department in efforts to deal with this important public health problem. The visitors, assisted by various officers of the Medical Department, are engaged on a survey throughout the Island. The inadequate accommodation for male patients at the Athalassia Sanatorium was augmented, and through the generosity of Mr. M. C. Georgiades a pavilion for the accommodation of 8 female patients was erected. The Honorary Physician, Dr. T. K. Evangelides, contributes a special report on the year's work at this institution.

During the year 280 cases of *pulmonary tuberculosis* were reported in the Island. It is stated that as notification is incomplete the recorded facts are no measure of actual incidence. Among 185 hospital in-patients treated for all forms of tuberculosis with 34 deaths, 118 were suffering from the pulmonary form of the disease and 29 died. Among out-patients 228 out of 366 tuberculosis patients were pulmonary cases.

It is stated that as finances permit, tuberculosis control work will develop along lines requiring (*a*) the appointment of a full-time British Tuberculosis Officer, (*b*) of Tuberculosis Nurses, and (*c*) the establishment of Tuberculosis Dispensaries at Nicosia, Larnaca, and Limassol.

Trachoma, as shown by notified cases, is a major Public Health problem, and serious efforts are necessary to bring it under control. During the year 8,963 cases were notified and approximately 15,000 cases of eye disease, mostly trachoma, were seen; the Honorary Oculist dealt with 2,983 new cases of which 1,499 were trachoma, and the three Travelling Oculists with 8,590 new patients, of which 7,464 were suffering from trachoma. Fifteen nurses received special training in the Government Hospital, and later were posted at trachoma centres where incidence was highest to carry out routine treatments prescribed by the Travelling Oculists. It is hoped to increase their

numbers in the near future and also to provide a travelling eye clinic adequately staffed.

Venereal Diseases.—The Medical Officer in charge of V.D. Clinics, Dr. N. MICHAELIDES, contributes as an Appendix to the Annual Report a comprehensive survey of the year's work at the five established clinics. Altogether 1,867 new and 1,026 old cases were dealt with amongst male patients; among the new patients were 331 cases of *syphilis*, and 574 of *gonorrhoea*, the corresponding figures for old cases continuing treatment were 668 and 358 respectively. Among 853 new female patients, 182 were suffering from *syphilis* and 308 from *gonorrhoea*; there were also 1,014 female patients continuing treatment and of these 514 were syphilitics and 500 suffering from gonorrhea. Blood samples submitted to Wassermann tests from the clinics totalled 4,389 and of these 1,316 gave positive and 100 doubtful reactions. The Laboratory Report records 4,698 Wassermanns of which 1,269 reacted positively and 344 gave doubtful reactions. The campaign against V.D. was continued throughout the year.

Leprosy.—To the Leper Farm Hospital which has accommodation for 12 patients, 66 admissions were recorded during the year; at the clinic attached to this hospital lepers are given their injections and dressings. At the Leper Farm itself 14 patients were admitted, 5 died, and 11 were paroled during 1936 and at the end of the year there remained 105 lepers at this institution.

Dr. S. LYSANDRIDES, Medical Superintendent of the *Mental Hospital* again contributes in an Appendix to the Annual Report a detailed account of the year's work at that institution. He observes that during 1936 the number of patients admitted and the number under treatment were the greatest ever recorded. Patients admitted or re-admitted totalled 64, ten died, 34 were discharged, and at the end of the year 205 remained. A 12-bed hospital for the treatment of patients physically ill has been erected.

Other diseases commented upon in the Report include the following. In-patients suffering from *cancer* numbered 195 and 9 of them died; there were also 252 out-patients treated for this condition. In an Appendix to the Annual Report, the Surgical Specialist, Dr. C. C. CUFF, deals at some length with the work of his Department, and among other matters supplies a detailed survey of the results of radium therapy and the surgical operations carried out for malignant disease. *Rheumatism* appears to be the cause of much disability: 116 in-patients and 3,162 out-patients received treatment for the disease. With regard to *helminthic diseases*, it is noted that no cases of *ankylostomiasis* or *schistosomiasis* were recorded. Of the latter condition it is stated the disease has almost disappeared, and that the snail hosts of the infection are not readily found. Hospital cases of *ascariasis* numbered 197, of *taeniasis* 60, and of *oxyuriasis* 217. No less than 2,918 persons received hospital treatment for wounds of various kinds, 1,520 having been caused by stabbing or cutting instruments.

[It is noted that in the "*Returns of Diseases and Deaths*" the nomenclature employed is that of the International Commission 1920. The most recent revised International List is that of 1929.]

Scientific.—The eleven *Special Reports* figuring as Appendices to the Annual Report are (1) Report on the Re-organization of the Medical Department, by the Director of Medical Services, Dr. E. A. NEFF; (2) Report of the Surgical Specialist; (3) Pathologist; (4) Chemist; (5) International Health Division, Rockefeller Foundation; (6) Mental

Hospital; (7) Communicable Diseases; (8) V. D. Clinics; (9) Honorary Dentist; (10) Athalassa Sanatorium; and (11) Limassol Municipal Health Report. The majority of these have already been quoted in the preceding notes.

The Report of the Pathological Branch records a further increase in the volume of work dealt with. During the year 10,031 specimens of various kinds were received, examined and reported upon—the more important of these and findings recorded are briefly referred to under various headings in the preceding summaries. *The Government Analyst* received and analysed 1,671 samples of which 1,657 were from official sources and included 849 samples of foods and drugs. The Government Analyst who was on the Board of Examiners in Pharmacy for the Government Qualifying Certificate, also gave a course of lectures on subjects of sanitary importance at the School for Sanitary Inspectors.

The following scientific papers were published :—

WILLIMOTT (S. G.). A Study of Colocasia (*Colocasia antiquorum*, Schott).
——, and FREIMAN (M.). Potassium Permanganate Poisoning. [This paper was noted in this *Bulletin*, 1937, Supp., p. 127*.]

Financial.—Total expenditure on Medical Department services during 1936 amounted to £53,555, a sum approximating 7 per cent. of the total expenditure of the Colony for the year under review.

P. Granville Edge.

GIBRALTAR (1936).

Gibraltar consists of a long mountain block (the "Rock") rising to a height of 1,396 feet, 3 miles long and ¾ mile broad, joined by a low sandy isthmus to the southern extremity of Spain. The town is built on the western and southern sides of the Rock, facing the Bay of Algeciras; the northern and eastern faces are inaccessible cliffs.

Vital Statistics.—At the end of the year the Police estimate of the resident population was 19,194 persons; 16,875 were British subjects and 2,319 were Aliens. The revolution which broke out in Spain in July caused a considerable influx of refugees from neighbouring ports of Spain; exact numbers are unknown, but the Medical Officer of Health was of the opinion that for a short time after the 18th of July "the excess population was not far short of ten thousand." Statistical facts refer solely to the normal resident population. *Registered births* numbered 304 and deaths of British subjects 249 and resident Aliens 12, or a total of 261. [The crude birth and death rates are given as 19·3 and 15·47 respectively but it is difficult to know how these rates were calculated. On the basis of end-of-year total resident population (no mid-year estimate is supplied) the birth rate would be 15·8 and the death rate 13·6 per 1,000. The same sort of difficulty was experienced a year ago in regard to methods applied for the calculation of rates (see this *Bulletin*, 1937, Supp., pp. 127*–128*)].

Infant deaths numbered 19 and the infant mortality rate is stated to be "62·09 per 1,000 births." [If the latter were true then it would appear to have been calculated on a basis of 306 "births" (presumably all live births) but if on the basis of 304 births the rate would be 62·5 per 1,000. In another part of the report it is stated "23 *stillbirths* were recorded." If these were included in the 304 births referred to then the I.M.R. would correctly be 67·6 per 1,000 live births].

Maternity and Child Welfare Work.—During the early part of the year the plans for increasing accommodation at the Colonial Hospital were carried out (see this *Bulletin*, 1937, Supp., p. 128*). Had this not been done it would have been impossible to deal with the large numbers of patients, for 283 women were admitted to the Maternity Wards during the year. Of the total admissions 176 belonged to the resident population and 107 were British subjects ordinarily resident in Spain and Spanish subjects temporarily living as refugees in Gibraltar; these groups were delivered of 151 and 90 babies respectively. At the Colonial Hospital one pupil commenced the course of training in midwifery. Of the work of midwives the only reference in the Report mentions that one under contract with the Public Health Department attends the confinements of poor persons (see also this *Bulletin*, 1937, Supp., p. 128*).

At the *Child Welfare Centre* fortnightly meetings continued to be held and the average attendance was 88. Milk and other foods were distributed at reduced prices or free in necessitous cases. The nurse paid 420 home visits and during the year 225 children were treated in the Children's Ward of the Colonial Hospital.

School Hygiene.—During the first six months of the year visits to 28 schools were paid and 185 children referred to the Medical Officer for examination and treatment; 40 were found to be suffering from defective vision or other eye defects, 45 from skin diseases, 31 from enlarged tonsils, 49 from general debility, and the remainder from other conditions; 129 of these children attended the School Clinic for treatment.

The School Dentist treated 478 children for various oral defects and continued his voluntary talks to children in the schools. The Soup Kitchen financed by voluntary subscriptions and operated by voluntary workers, continued to play an important part in maintaining nutrition during the winter months; the average daily attendance was 550.

Public Health, Sanitation, etc.—For descriptions of the Medical Services directly administered by the Colonial Government, the sanitary work under the City Council, and the Board of Health Quarantine Services see this *Bulletin*, 1933, Supp., p. 114*; 1935, p. 115*; and 1936, p. 119*. *Sewage and Refuse disposal* methods remain for all practical purposes as described on page 100* of the 1934 issue of this Supplement.

With regard to potable *water supplies* it is reported that a new reservoir of one million gallons storage capacity was completed and brought into use, and that extensive repairs and renewals to catchment areas were carried out during the year. *Brackish water* is supplied from wells for general purposes other than potable.

In August H.E. the Governor appointed a Commission of Enquiry on the Housing, Rent Restriction, etc., to report upon the position in Gibraltar; the results of the enquiry will be referred to in the 1937 Medical and Sanitary Report. With a view to testing the value of some of the Commission's proposals a block of model tenements for the working classes was designed and erected; families from properties in bad repair were removed and though rents were higher, willingly accepted the exchange to the new dwellings. The experiment proved highly successful.

The routine supervision of milk and food shops, inspection of foods for human consumption, etc., was continued and samples taken for

analysis from time to time (see this *Bulletin*, 1937, Supp., p. 129*). For some weeks following the outbreak of hostilities in Spain there was an acute shortage of *milk supplies* but the situation became normal towards the end of the year.

The outbreak of hostilities in Spain in July imposed additional responsibilities on the Public Health Authorities of Gibraltar, and emergency measures had to be devised to meet exceptional conditions. For the accommodation of refugees who flocked to the Colony a Camp under the control of a Commandant was established at the North Front with a Medical Clinic, volunteer nurses, and arrangements made for the feeding of these temporary residents. Serious medical and surgical cases were dealt with at the Colonial Hospital.

Port Health Work.—The Board of Health exists as the quarantine authority for the Colony (see also this *Bulletin*, 1937, Supp., p. 129*). During the year 4,971 ships called at the port, 77 cases of sickness were landed from British and 29 from foreign vessels. Rat destruction continues to be carried out; 96 carcases were examined at the Laboratory; none was found to be plague infested.

Hospitals, Dispensaries, etc.—The year's record of work at various institutions in the Colony may be set out as follows :—

Institution	Admissions	Treated	Died	Out-patients
Colonial Hospital ...	1,641	1,769	124	11,606
Isolation ,, ...	Three cases of leprosy (see this *Bulletin*, 1937, Supp., p. 129*)			
Mental ,, ...	9	45	4	—
Home for Sick and Aged	—	55	—	131 in receipt of outdoor relief

The work of the Colonial Hospital was appreciably influenced by the civil disturbances in Spain; in-patient cases increased from July to the end of the year and the abnormal movement of shipping combined to bring in a number of cases of sick seamen. Principal features characterizing health experience in the Colony during the year included the following :—

Recorded cases of infectious diseases totalled 177. *Diphtheria* was responsible for 44 cases with 2 deaths from laryngeal infections; all other cases were mild in type. At the Laboratory where 96 throat swabs were examined 39 contained the Klebs-Loeffler bacillus, while a pure culture of virulent *C. diphtheriae* was obtained on one occasion from a leg ulcer. Of *enteric fever* 17 cases were reported and two patients died; no source of infection could be traced. Among 42 Widal tests at the Laboratory 22 bloods agglutinated positively with *Bact. typhosum* "*H*" and three with *Bact. paratyphosum* "*B*." (The blood of all persons about to be employed as milk-vendors, waiters, etc., is serologically examined to detect possible carriers of the enterica group of bacilli.) Only 3 cases of *dysentery* were notified.

Thirty new cases of *pulmonary tuberculosis* and 19 deaths due to this cause were registered. Further consideration was given to the control and treatment of the disease and during the year a Medical Officer with special experience of tuberculosis was appointed (see also this *Bulletin*, 1937, Supp., p. 130*). Of the 125 specimens of sputum examined at the Laboratory 16 per cent. were positive with *Myco. tuberculosis*.

The Venereal Diseases Clinic established in the Colonial Hospital dealt with 44 in-patient cases distributed as to 11 *syphilis*, 9 *soft chancre* and 23 *gonococcal infections*. The usual examinations of blood and cerebrospinal fluid for Wassermann tests and pus smears for gonococci were undertaken at the City Council Laboratory; 98 out of 753 Wassermanns gave positive results and the gonococcus was found in 34 smears.

Other experiences referred to in the Report under review included the following.

Though no cases of *rabies* was recorded, for the first time a course of preventive inoculations was given to a British seaman bitten by a rabid dog in Valencia. The first recorded death from *tetanus* in the Colonial Hospital was recorded following an accident in Gibraltar; the case may not have been a true Gibraltar infection as the boy was wounded by the shaft of a Spanish cart. After the occurrence of this fatal case it was however considered advisable to give preventive inoculations in cases of street accidents, etc. *Gas gangrene* was recorded for the first time in the Colony with two cases in boys, one was brought in from Spain and lived only 4 days. The second was a Spanish boy who sustained a compound fracture of the leg by falling from a tree in Gibraltar; after injections of anti-gas gangrene serum and amputation of the leg he made a good recovery. The first case of *kala-azar* to be recorded in Gibraltar occurred in an Indian ship's fireman probably infected in Egypt. Thirty-one cases of *scarlet fever*, 24 of *measles*, 23 of *chickenpox*, one of *undulant fever* and one of *cerebrospinal meningitis* were among other diseases reported. No case of *smallpox* occurred; 365 primary and 310 re-vaccinations were performed during the year.

Scientific.—A summary of the Laboratory work is supplied by the City Analyst and Bacteriologist, Mr. A. G. Holborow, F.I.C. During the year under review 6,150 samples of various kinds were received, examined and reported upon. Many of these have been the subject of brief mention in the preceding notes, but it remains to say that public supplies of drinking waters were bacteriologically tested each month and remained free from pollution throughout the year. Serological agglutination tests were carried out on 115 goats, all with negative results; one human blood specimen agglutinated positively for *Br. melitensis*. Other laboratory work included medico-legal and veterinary examinations, the testing of oil-carrying ships for the presence of inflammable vapour, preparation of autogenous vaccines, etc. Mr. Holborow refers briefly to his original work on *canine leishmaniasis* and its prevention, first referred to in the Medical Report for 1934 (see this *Bulletin*, 1936, Supp., p. 122*; and 1937, Supp., pp. 130*–131*). This work has now been successfully completed. It is of interest to note that as a result of systematic dipping, the years 1935 and 1936 marked the absence of the disease among the hounds for the first time in the history of the Royal Calpe Hunt; it is added that in some years all hounds have been known to succumb. Sandflies were suspected as the vectors of infection, while ticks, fleas, and lice were also under suspicion; dipping entirely eliminated these pests.

Financial.—Expenditure on Medical and Sanitary Services amounted to £23,228, the Colonial and Isolation Hospitals accounting for £15,528 of the total expenditure. *P. Granville Edge.*

MALTESE ISLANDS (1936).

The Maltese Islands, a group of islands in the Mediterranean Sea, are distant about 58 miles from the nearest point of Sicily, 80 from Syracuse, 142 from Reggio and 180 from the nearest point of the mainland of Africa. Malta itself is 17 miles long, 9 broad and has an area of almost 95 sq. miles; Gozo, 26 sq. miles., Comino and Filfla are mere islets, the area of the former being about 1 sq. mile. The whole group has about half the area of the Isle of Man.

Vital Statistics.—The recorded facts relating to these Islands continue to be presented in great detail, *viz.*, *Population*, total at all ages for each locality, and also in age groups 0–1, 0–5, and 5 and over. *Births* and *Deaths*, totals for each locality. Mortality data also presented by causes of death for each month of the year; by sex and in 13 age groups for each locality; by causes of death for each sex in 17 age groups. Summarizing the principal facts, we have :—

	Malta	Gozo	Both Islands
Estimated Population	236,479	25,686	262,165
Births	8,110	765	8,875
Birth rate per 1,000	34·2	29·7	33·8
Deaths	4,167	420	4,617
Death rate per 1,000	17·7	16·4	17·6
Infant Deaths	1,545	144	1,689
Infant Mortality Rate per 1,000 Live Births	190·5	188·2	190·3

The Infant Mortality rate, though still high, appears to be the lowest ever recorded for these Islands.

Maternity and Child Welfare Work.—A general service of a preventive and advisory nature for ante-natal and post-natal care of mothers and for infant welfare has still to be set up. Meanwhile consultations for out-patients are held at the Central Hospital and the District Dispensaries; District Nurses visit newly confined mothers and give advice on infant care, etc., 6,915 such visits were paid in Malta and 1,118 in Gozo. The Mothers' and Infants' Health Association, in receipt of an annual contribution, has established Health Centres in four towns. Lying-in Wards are provided in the General Hospitals in both Islands. Outside the Hospitals it is said that practically every confinement is attended by a certified midwife, Government paying the fee in necessitous cases.

School Hygiene receives no mention in the Report under review except in the observation, "Systematic teaching of the rules of health should form an integral part of the ordinary curriculum in the schools."

Public Health, Sanitation, etc.—Dr. A. V. Bernard, the newly appointed Chief Government Medical Officer, pays a generous tribute to the valuable public health work accomplished by his predecessor, Dr. A. Critien, who retired from the service in October 1936.

As regards general sanitation, towns, suburbs, and several villages are provided with water-borne *sewerage* systems: several extensions were carried out during the year. Where no sewers exist, house drains are connected with impervious cess-pits. Towards the end of the year the objectionable methods characterizing the unorganized collection of

refuse were abolished, and an improved service inaugurated. Piped *water supplies* are available in almost every part of both Islands. Drought conditions during the year necessitated restricted supplies; new storage galleries when completed will provide welcome increases in main supplies. *Housing* accommodation increases fairly satisfactorily; all new buildings, alterations, and additions to existing buildings, etc., must first receive the approval of the Superintendent of Public Health. The routine inspection of *food*, of shops, stores, slaughter-houses, etc., continued as usual. In a series of Appendices to the Report under review detailed accounts of the various public health services are presented.

Port Health Work.—The Quarantine Medical Officer is also Medical Officer of the Infectious Diseases Hospital in Malta; the year's work is described at length in an Appendix to the Annual Report. Briefly, 1,971 steamships and 131 sailing vessels entered Malta ports and the arrivals of 6 British and 95 foreign aircraft were recorded. Inward passengers numbered 13,333, and outward passengers 12,052. Eighty-seven steamers were kept in quarantine; 65 reported having or having had infectious diseases on board. Three cases of infectious disease among passengers and crews were admitted to the Contagious Diseases Hospital and 11 to other hospitals. A Sanitary Inspector was appointed to the Port Health Staff during the year. The trapping of rats in harbour areas continued; it is stated that none was found plague-infested (but see also *Plague* below).

Hospitals, Dispensaries, etc.—These institutions are occasionally mentioned here and there in the text of the Report, but are not dealt with in detail in any separate section. Available information seems to indicate that four institutions have accommodation for in-patients and facilities for the treatment of out-patients, *viz.*, the Central Hospital, Connaught Hospital, Gozo Hospital and the Poor House; there are also a number of District Dispensaries.

Twenty-six diseases are scheduled as compulsorily notifiable. No case of smallpox, cholera, yellow fever, typhus, dengue, indigenous malaria or hydrophobia has been recorded for many years, but the remaining 19 titles on the notifiable list gave rise to 2,560 cases with 370 deaths. At the Contagious Diseases Hospital 351 cases were treated and among these 27 deaths occurred. The principal diseases referred to in the Report may be summarized as follows.

Plague occurred in April, the Islands having been practically free from the infection for over a century. Suspicious symptoms were first reported in three members of the same family, two died and post-mortem bacteriological investigation showed infection with *P. pestis*. Energetic measures were promptly instituted to deal with the infection, for further investigation indicated an epizootic among rats. A fourth case was discovered at the end of April, and thereafter cases continued to occur each month until November; during the whole period 25 cases were recorded, 19 of them gave positive bacteriological findings, and 10 deaths were ascribed to the infection. At the Laboratory where 2,069 rats and mice, 28 cats, 17 rabbits, and 9 guineapigs were examined, 16 rats, one cat, and one guineapig were found infected with *P. pestis*. Dr. Bernard contributes a survey of plague history in Malta from the beginning of the 19th century; District Medical Officers describe cases occurring in their respective areas and the measures taken to localize the infection. The outbreak has been reviewed at some length in this *Bulletin*, 1938, Vol. 35, p. 205.

No case of *smallpox* occurred ; 4,281 primary vaccinations (infants) were performed by District Medical Officers, and 93 per cent. were reported successful. *Diphtheria* was responsible for 115 cases and 14 deaths ; prophylactic inoculation is said to have made no headway in the Islands. Scattered cases occurred during every month of the year. *Scarlet fever* incidence showed a further decline with 40 cases and one death. The tail-end of the *measles* epidemic which characterized 1934 and 1935 appears to have been reached for only 52 cases, all non-fatal, were recorded. On the other hand *whooping-cough* showed increased incidence with 381 cases and nine deaths.

Enteric fever shows the lowest incidence for many years, 163 cases and 28 deaths. The infection was mostly of the summer type, unconnected with the piped water supplies, and confined to the poorer and less careful classes of the population.

Fewer cases and deaths due to *undulant fever* were recorded, *viz.*, 873 cases and 52 deaths, or a decline of 33 per cent. in incidence and 35 per cent. in mortality by comparison with 1936 experience. The routine testing of goats for *Br. melitensis* was continued throughout the year ; 9·4 per cent. of the animals gave positive reactions and were destroyed. In January 1936, the *Undulant Fever Research Station* commenced their investigations ; research will principally be directed towards the preventive immigration of goats. Work on the building of the *Milk Pasteurization Station* was started and a Manager of the Milk Centre appointed. A safe supply of fresh milk should shortly be available.

Notified cases of *pulmonary tuberculosis* numbered 173 and deaths due to this cause 109. The decline in incidence and mortality is attributed to favourable climatic conditions and absence of influenza (only 18 cases of the latter). The erection of a Tuberculosis Block, Sanatorium for Convalescents, Tuberculosis Clinics, and provision for the after-care of the tuberculous, are among the recommendations made for dealing with the disease.

During the year under review 232 "new" (see this *Bulletin*, 1937, Supp., p. 133*), and 1,073 "old" cases of *trachoma* were reported, 187 of the former and 533 of the latter being recorded in Malta. Ample facilities for free skilled treatment are available in both Islands. At the Ophthalmic Clinic of the Central Hospital, 520 persons were treated, 93 as in-patients ; in the Special Wards of the Poor House 78 patients were accommodated, and at the Victoria Hospital, Gozo, 45 patients were dealt with. School-children receiving treatment in Malta averaged 323 per month, and in Gozo 294 ; District Dispensaries in Malta dealt with an average of 241 patients per month and 192 in Gozo.

Other diseases mentioned in the Report include 83 cases of *pneumonia* with 30 deaths, 150 of *broncho-pneumonia* and 98 deaths, 3 non-fatal cases of *acute anterior poliomyelitis*, 2 non-fatal cases of *cerebrospinal meningitis*, 2 fatal cases of *encephalitis lethargica*, and 68 cases of *erysipelas* with 3 deaths.

Scientific.—At the Laboratory the 12,733 samples received and dealt with included 6,132 bloods, 3,547 of foods, beverages, etc., 2,206 pathological specimens and 848 water samples. The results of the various examinations are set out in a series of Tables. The activities of the Staff were mainly concerned with plague work—cases investigated are described in some detail. Among other items of work it is noted

that District Medical Officers and Private Practitioners submitted 4,196 samples of human blood for serological test of undulant and typhoid fevers; 982 agglutinated positively with *Br. melitensis* and 51 with *Bact. typhosum.* Also 1,936 specimens of blood from goats, the majority submitted by Officials of the Civil Abattoir, were examined and 182 were declared infected with undulant fever.

Financial.—No details covering expenditure on medical services are supplied.

P. Granville Edge.

REVIEWS AND NOTICES.

CASTELLANI (Aldo) [K.C.M.G., D.S.C., M.D., F.R.C.P., etc.]. **Climate and Acclimatization. Some Notes and Observations.** 2nd Edition. —pp. x+198. With 16 figs., 1 coloured map & 1 plate. 1938. London: John Bale, Sons & Curnow, Ltd., 83–91 Great Titchfield Street, W.1. [10*s*.]

The author emphasizes in his prefaces that this little book "does not aim at being an exhaustive work, but is merely a collection of notes based on personal experience gathered in long sojourns in many different tropical climates." He further states that only some minor alterations and additions have been made in the present edition. The new edition contains forty-two additional pages, eight of which are devoted to the health conditions in the Italo-Ethiopian War, which it is claimed were very superior to those ever obtained previously in any war in a hot climate.

The scope of the work can be gathered from the following subdivisions of his subject. The first chapter deals with the climatic conditions in different parts of the world, illustrated by diagrams. Chapter II is the longest and most important, and deals with the physiological and pathological effects of climatic conditions. The most interesting is the section on heatstroke, although it is printed in small type. The author disagrees with the views of Manson, Sambon and others in attributing the ill effects met with in tropical climates almost solely to parasitic conditions, and the hypothesis that heatstroke is due to a microbe. The treatment of this condition is fully dealt with, but the author's statement that quinine is of no use is not in accordance with the reviewer's experience in India, where he has used it to prevent the tendency to recurrence of hyperpyrexia.

Chapter III deals with effects of climatic conditions on the skin more especially, including the effects of different rays of the spectrum, In Chapter IV, on acclimatization, the author disagrees with Manson and Gorgas that climate *per se* has no deleterious effect on the white man, and that with proper sanitary and other measures the European would be quite capable of living healthily in tropical countries. He refers to the substitution of white for Kanaka labour in the Queensland sugar plantations with success, but is doubtful if the white races can maintain their vigour in the tropics to the third generation.

Within the limits set by the author this book contains much useful information, but practically nothing is included of the influence of climate on the seasonal incidence and the occurrence of epidemics of diseases in the tropics on which much work has been done in recent years. It is also to be regretted that the index is quite inadequate. For example, the recent work of Crowden on the protective value of aluminium foil against sunstroke is mentioned in the text, but does not appear in the index. *L. Rogers.*

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